

SHARP SERVICE MANUAL

No. 00ZUX310DESME

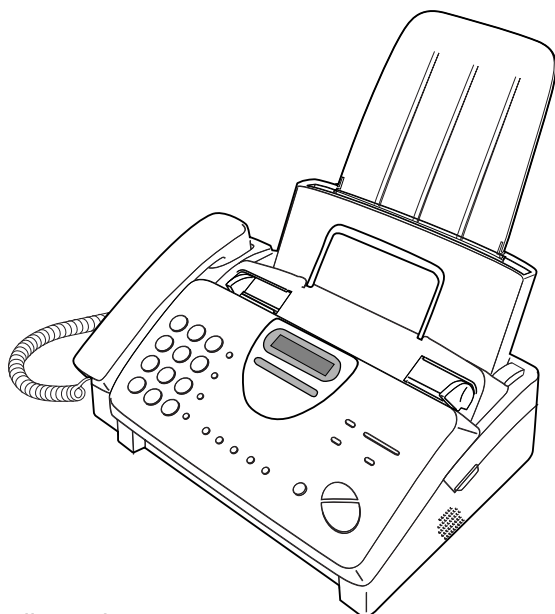


Illustration: UX-310

FACSIMILE

UX-310
FO-730
MODEL NX-530

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PARTS GUIDE

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used
for after sales service only.
The contents are subject to change without notice.

CAUTION FOR BATTERY REPLACEMENT

- (Danish) ADVARSEL !
Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandoren.
- (English) Caution !
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type
recommended by the equipment manufacturer.
Discard used batteries according to manufacturer's
instructions.
- (Finnish) VAROITUS
Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden
mukaisesti.
- (French) ATTENTION
Il y a danger d'explosion s' il y a remplacement incorrect
de la batterie. Remplacer uniquement avec une batterie du
même type ou d'un type recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux
instructions du fabricant.
- (Swedish) VARNING
Explosionsfare vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent
typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens
instruktion.
- (German) Achtung
Explosionsgefahr bei Verwendung inkorrektter Batterien.
Als Ersatzbatterien dürfen nur Batterien vom gleichen Typ oder
vom Hersteller empfohlene Batterien verwendet werden.
Entsorgung der gebrauchten Batterien nur nach den vom
Hersteller angegebenen Anweisungen.

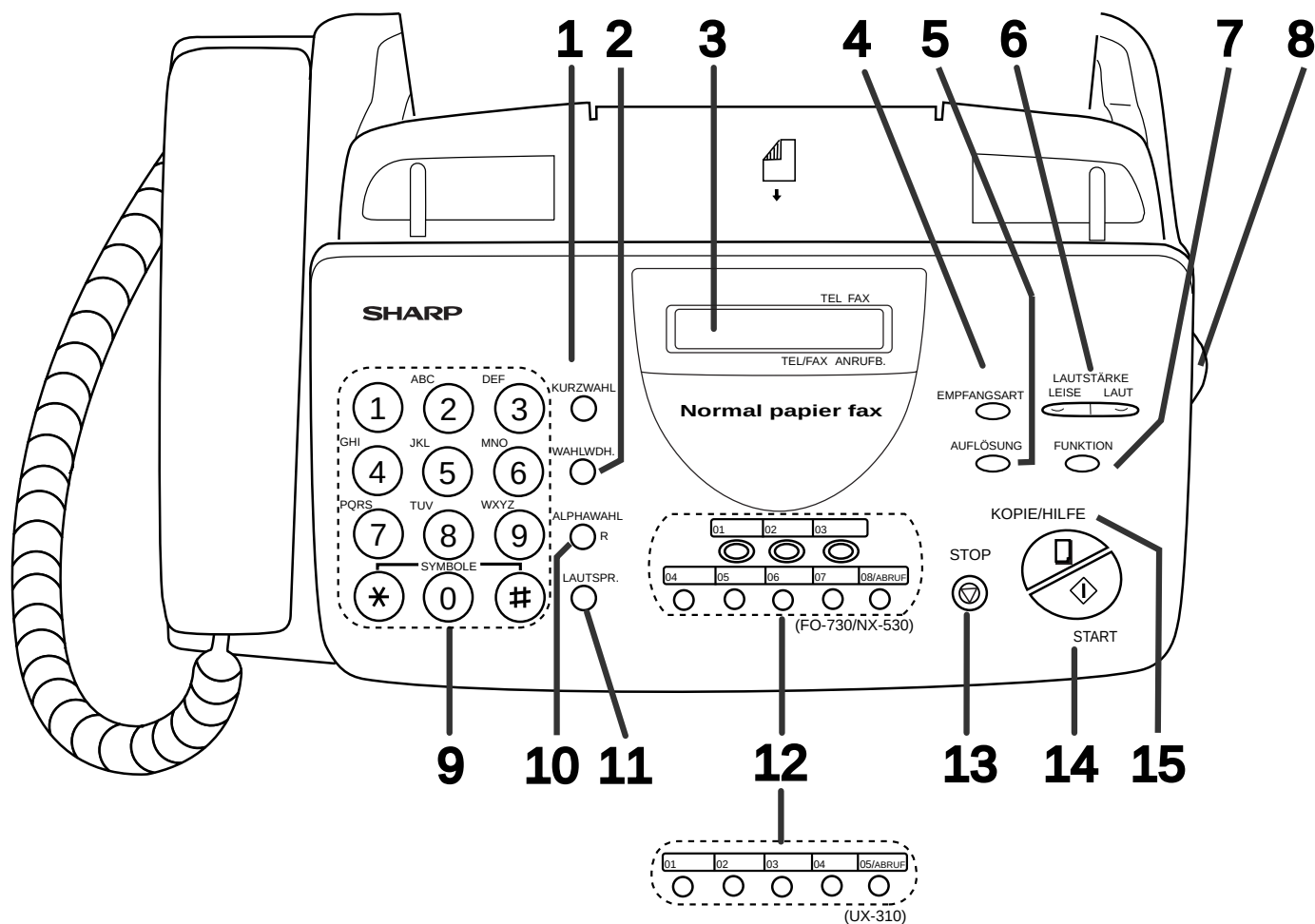
CHAPTER 1. GENERAL DESCRIPTION

[1] Specifications

Automatic dialing: (UX-310)	Rapid Key Dialing: 5 numbers Speed Dialing: 40 numbers	Effective scanning width:	210 mm max.
Automatic dialing: (FO-730/NX-530)	Rapid Key Dialing: 8 numbers Speed Dialing: 80 numbers	Contrast control:	Automatic/Dark selectable
Imaging film:	Initial starter roll (included with fax machine): 10 m roll (approx. 30 A4 pages) Replacement roll: UX-3CR 30 m roll (two rolls in package, one roll yields approx. 95 A4 pages)	Copy function:	Standard
Automatic document feeder:	10 sheets max.	Telephone function:	Standard (cannot be used for incoming/outgoing if power fails)
Modem speed:	9600 bps with automatic fallback to 7200, 4800, or 2400 bps	Power requirements:	220-230 V AC, 50 Hz
Transmission time* :	Approx. 22 seconds	Operating temperature:	5 to 35°C
Display:	16-digit LCD display	Humidity:	Maximum: 85 %
Reception modes:	FAX, TEL, TEL/FAX, A.M.	Power consumption:	Stand-by: 2.3 W Maximum: 115 W
Resolution:	Horizontal: 8 dots/mm Vertical: Standard: 3.85 lines/mm Fine/Halftone: 7.7 lines/mm Super fine (transmission only): 15.4 lines/mm	Dimensions:	Width: 343 mm Depth: 313 mm Height: 312 mm
Recording system:	Thermal transfer recording	Weight:	Approx. 3.4 kg
Halftone (grayscale):	64 levels	* Based on ITU-T (CCITT) Test Chart #1 at standard resolution in Sharp special mode, excluding time for protocol signals (i.e., ITU-T phase C time only).	
Applicable telephone line:	Public switched telephone network / PBX		
Compatibility:	ITU-T (CCITT) G3 mode	Note: The facsimile machine is Year 2000 compliant.	
Configuration:	Half-duplex, desktop transceiver		
Compression scheme:	MH, MR		
Scanning method:	Sheet-feeder CIS (Contact Image Sensor)		
Effective recording width:	208 mm max.		
Input document size:	Automatic feeding: Width — 148 to 210 mm Length — 140 to 297 mm Manual feeding: Width — 148 to 210 mm Length — 140 to 600 mm		

As a part of our policy of continuous improvement, SHARP reserves the right to make design and specification changes for product improvement without prior notice. The performance specifications figures indicated are nominal values of production units. There may be some deviation from these values in individual units.

[2] Operation panel



1. KURZAHL (SPEED DIAL key)

Press this key to dial a 2-digit Speed Dial number.

2. WAHLWDH. (REDIAL key)

Press this key to automatically redial the last number dialed.

3. LCD-Anzeige (Display)

This displays messages and prompts during operation and programming.

4. EMPFANGSART (RECEPTION MODE key)

Press this key to select the reception mode. An arrow in the display will point to the currently selected reception mode.

5. AUFLÖSUNG (RESOLUTION key)

Press this key to adjust the resolution and contrast before sending or copying a document.

6. LAUTSTÄRKE (VOLUME keys)

Press these keys to adjust the volume of the speaker when the **SPEAKER** key has been pressed, or the volume of the ringer at all other times.

7. FUNKTION (FUNCTION key)

Press this key to select various special functions.

8. BEDIENFELD ENTRIEGELN (Panel release)

Grasp this finger hold and pull toward you to open the operation panel.

9. Zifferntasten (Number keys)

Use these keys to dial numbers, and enter numbers and letters during number/name storing procedures.

10. ALPHAWAL/R (SEARCH/R key)

Press this key to search for an automatic dialing number, or, if you are on a P.B.X. extension, press this key to transfer or put the other party on hold.

11. lautspr. (SPEAKER key)

Press this key to hear the line and fax tones through the speaker before sending a document, or dialing a voice number.

Note: **This is not a speakerphone.** You must pick up the handset to talk with the other party.

12. Zielwahlkosten (Rapid Dial keys)

Press one of these keys to dial a fax or voice number automatically. (Note that you must attach the Rapid Key labels.)

13. STOP (STOP key)

Press this key to cancel operations before they are completed.

14. START (START key)

Press this key to send or receive a document manually when off hook.

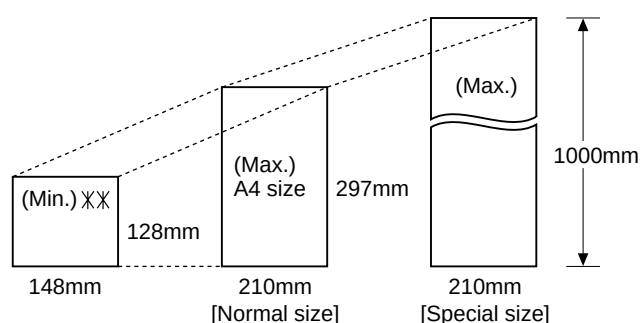
15. KOPIE/HILFE (COPY/HELP key)

When a document is in the feeder, press this key to make a copy. At any other time, press this key to print out the Help List, a quick reference guide to the operation of your fax.

[3] Transmittable documents

1. Document Sizes

Normal size	width	148 – 216 mm
	length	128 – 297 mm



XX Use document carrier sheet for smaller documents.

* With special sizes, only one sheet can be fed into the machine at a time. Insert next page into feeder as current page is being scanned.

2. Paper Thickness & Weight

Normal size	ADF 10 sheets	Thickness	0.06–0.09 mm
		Weight	52–80g/m ² 14–20lbs
Special size		Thickness	0.06–0.20 mm
		Weight	52–157g/m ²

3. Document Types

- Normal paper
Documents handwritten in pencil (No. 2 lead or softer), fountain pen, ball-point pen, or felt-tipped pen can be transmitted.
Documents of normal contrast duplicated by a copying machine can also be transmitted.
- Diazo copy (blue print)
Diazo copy documents of a normal contrast may be transmitted.
- Carbon copy
A carbon copy may be transmitted if its contrast is normal.

4. Cautions on Transmitting Documents

- Documents written in yellow, greenish yellow, or light blue ink cannot be transmitted.
- Ink, glue, and correcting fluid on documents must be dry before the documents can be transmitted.
- All clips, staples and pins must be removed from documents before transmission.
- Patched (taped) documents should be copied first on a copier and then the copies used for transmission.
- All documents should be fanned before insertion into the feeder to prevent possible double feeds.

5. Automatic Document Feeder Capacity

Number of pages that can be placed into the feeder at anytime is as follows:

Normal size: max. ADF 10 sheets

Special size: single sheet only (manual feed)

- NOTES:
- When you need to send or copy more pages than the feeder limit, place additional pages in feeder when last page in feeder is being scanned.
 - Place additional pages carefully and gently in feeder. If force is used, double-feeding or a document jam may result.

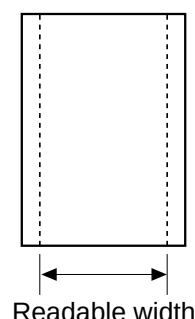
6. Readable Width & Length

The readable width and length of a document are slightly smaller than the actual document size.

Note that characters or graphics outside the effective document scanning range will not be read.

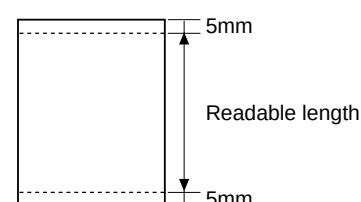
• Readable width

210mm, max.



• Readable length

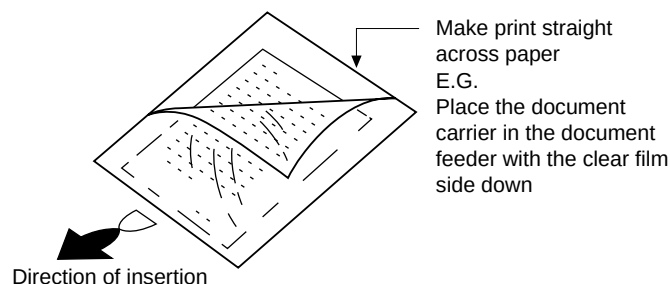
This is the length of the document sent minus 5mm from the top and bottom edges.



7. Use of Document Carrier Sheet

A document carrier sheet must be used for the following documents.

- Those with tears.
- Those smaller than size 148mm (W) x 128mm (L).
- Carbon-backed documents



NOTE: To transmit a carbon-backed document, insert a white sheet of paper between the carbon back of the document and the document carrier.

- Those containing an easily separable writing substance (e.g., tracing paper written on with a soft, heavy lead pencil).

NOTES:

- When using the document carrier, carefully read the instructions written on the back.
- If the document carrier is dirty, clean it with a soft, moist cloth, and then dry it before using for transmission.
- Do not place more than one document in the carrier at a time.

[4] Installation

1. Site selection

Take the following points into consideration when selecting a site for this model.

ENVIRONMENT

- The machine must be installed on a level surface.
- Keep the machine away from air conditioners, heaters, direct sunlight, and dust.
- Provide easy access to the front, back, and sides of the machine. In particular, keep the area in front of the machine clear, or the original document may jam as it comes out after scanning.
- The temperature should be between 5° and 35°C.
- The humidity should be between 30% and 85% (without condensation).

ELECTRICITY

AC 220-230V, 50Hz, earthed (2-prong) AC outlet is required.

Caution!

- Connection to a power source other than that specified will cause damage to the equipment and is not covered under the warranty.
- If your area experiences a high incidence of lightning or power surges, we recommend that you install a surge protector for the power and telephone lines. Surge protectors can be purchased at most telephone specialty stores.

If the machine is moved from a cold to a warm place...

If the machine is moved from a cold to a warm place, it is possible that the reading glass may fog up, preventing proper scanning of documents for transmission. To remove the fog, turn on the power and wait approximately 2 hours before using the machine.

TELEPHONE JACK

A standard telephone jack must be located near the machine.

This is the telephone jack commonly used in most homes and offices.

- Plugging the fax machine into a jack which is not an jack may result in damage to the machine or your telephone system. If you do not know what kind of jack you have, or needed to have one installed, contact the telephone company.

2. Loading the imaging film (UX-3CR)

Your fax uses a roll of imaging film to create printed text and images. The print head in the fax applies heat to the imaging film to transfer ink to the paper. Follow the steps below to load or replace the film.

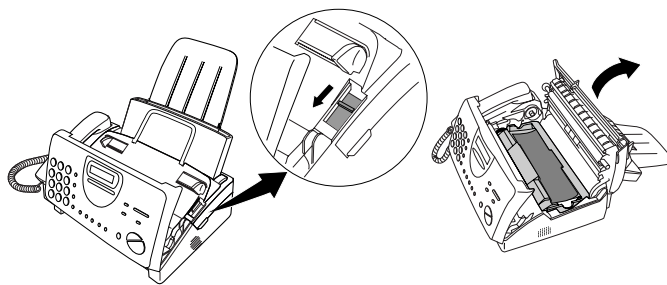
- The initial starter roll of imaging film included with your fax can print about 30 A4 pages.
- When replacing the film, use a roll of Sharp UX-3CR imaging film. One roll can print about 95 A4 pages.

Note: If there is paper in the paper tray, pull the paper release plate forward and remove the paper before loading the imaging film.

- ① Open the operation panel by grasping the finger hold and pulling up.

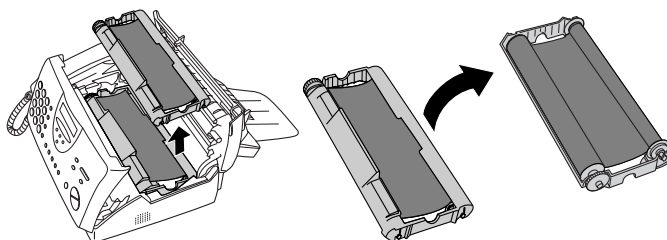


- ② Pull the green release on the right side of the machine forward, and open the print compartment cover.

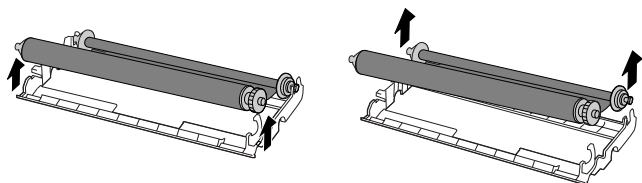


If you are installing the imaging film for the first time, go to Step 6.

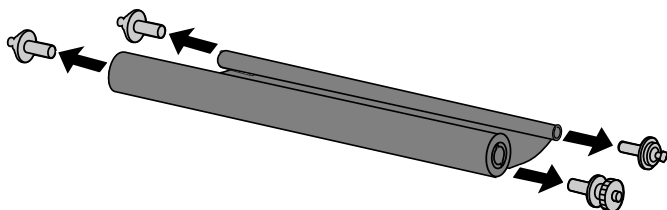
- ③ Remove the imaging film cartridge from the print compartment (grasp the handle at the front of the cartridge) and turn it over.



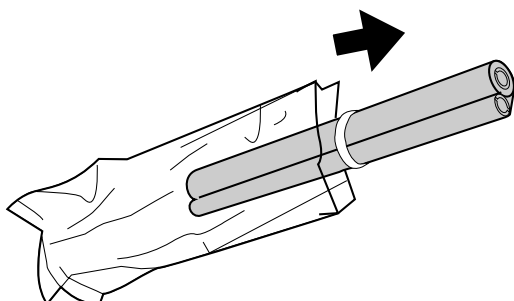
- ④ Remove the used film from the cartridge.



- ⑤ Remove the four green gears from the used film.
DO NOT DISCARD THE FOUR GREEN GEARS!



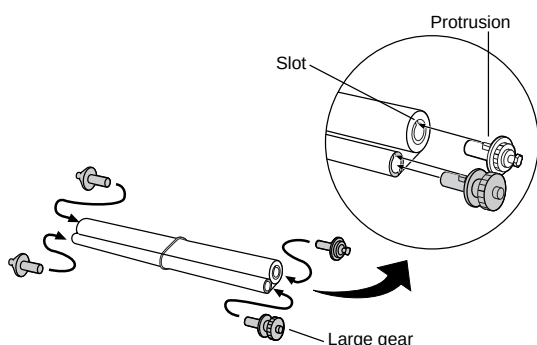
- ⑥ Remove the new roll of imaging film from its packaging.
• Do not yet remove the band that holds the rolls together.



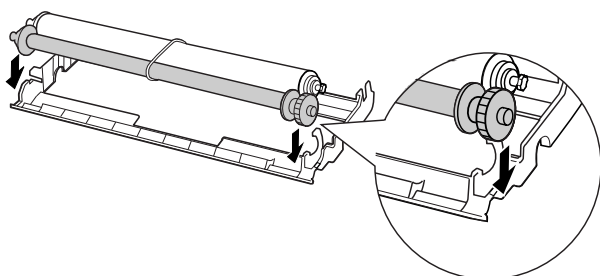
- ⑦ Insert the large gear into the green end of the empty spool. Make sure the two protrusions on the large gear fit firmly into the slots in the end of the spool.

Insert the remaining three gears into the spools, making sure the protrusion on each gear fits firmly into one of the slots in the end of each spool.

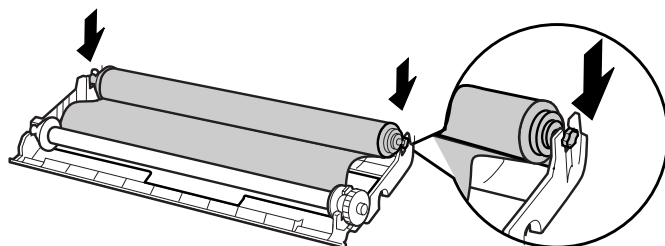
- If needed, pull the spools apart slightly to allow the gears to fit (the band will stretch).



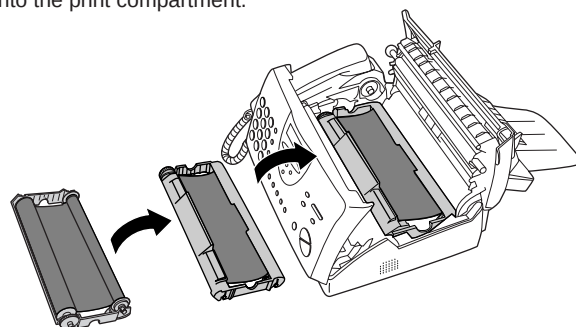
- ⑧ Insert the large gear into the large holder on the imaging film cartridge (make sure it clicks into place), and then insert the small gear on the other end of the spool into its holder.



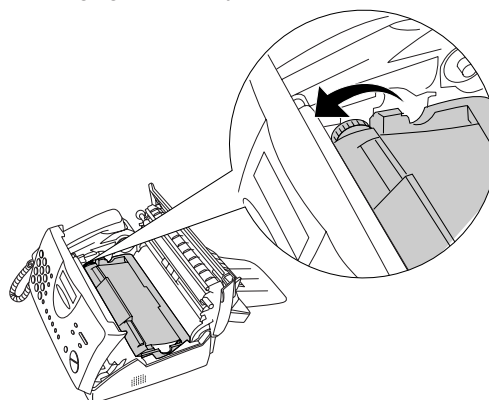
- ⑨ Cut the band that holds the two spools together. Unroll the film slightly and insert the small gears into their holders.



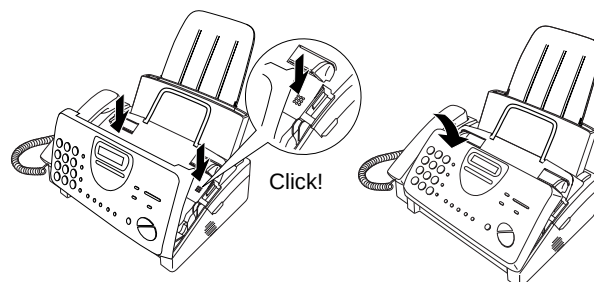
- ⑩ Turn the cartridge over, grasp the handle, and insert the cartridge into the print compartment.



- ⑪ Rotate the large gear toward you until the film is taut.



- ⑫ Close the print compartment cover (press down on both sides to make sure it clicks into place), and then close the operation panel.



- ⑬ Load paper in the paper tray and then press the following keys to initialize the film.

Note: Paper must be loaded before the film can be initialized. To load paper, see the following section, Loading the Printing Paper.

FUNCTION



Display shows:

INITIALIZE FILM



When to replace the imaging film.

Replace the imaging film when the display shows:

FILM END

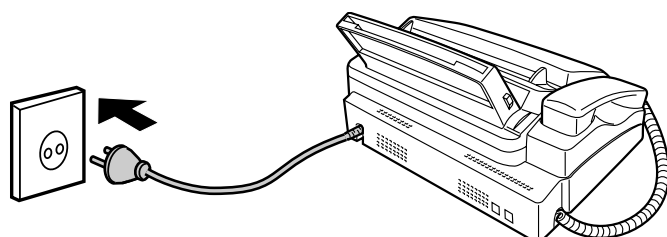
Use the following imaging film, which is available from your dealer or retailer: Sharp UX-3CR Imaging Film

3. Assembly and connections

- ① Plug the power lead into a 220-230 V, 50 Hz, earthed (2-prong) AC outlet.

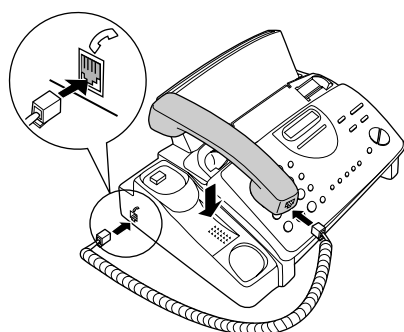
- **Caution:** The mains outlet (socket outlet) should be installed near the equipment and be easily accessible.
- The machine does not have a power on/off switch, so the power is turned on and off by simply plugging in or unplugging the power lead.

Note: If your area experiences a high incidence of lightning or power surges, we recommend that you install surge protectors for the power and telephone lines. Surge protectors can be purchased from your dealer or at most telephone specialty stores.



- ② Connect the handset as shown and place it on the handset rest.

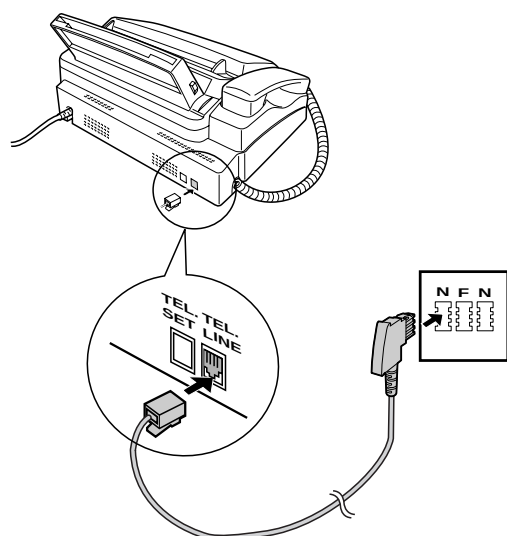
- ♦ The ends of the handset cord are identical, so they will go into either socket.



Make sure the handset cord goes into the socket marked with a handset symbol on the side of the machine!

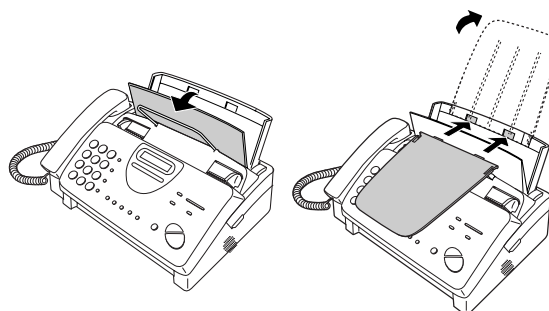
Use the handset to make ordinary phone calls, or to transmit and receive documents manually.

- ③ Insert one end of the line cord into the socket on the back of the machine marked **TEL.LINE**. Insert the other end into a wall telephone socket.



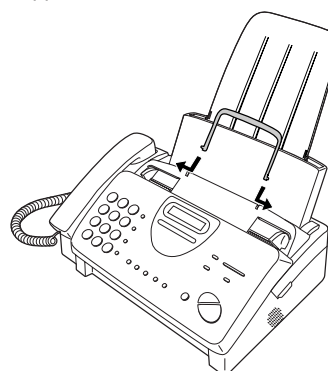
- ④ Attach the paper tray extension.

- ♦ Pull the paper release plate forward. Insert the paper tray extension horizontally into the notches in the paper tray. Rotate the paper tray extension up until it snaps into place.



- ⑤ Attach the original document support.

- Note:** The original document support has a top side and a bottom side. If you cannot insert the tabs on the support into the holes, turn the support over.

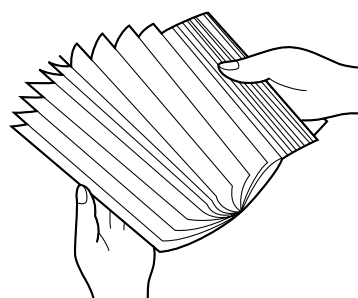


4. Loading printing paper

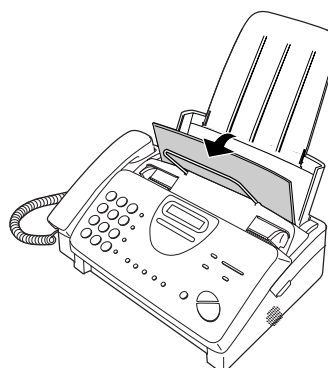
You can load letter or legal size paper in the paper tray. The maximum number of sheets is:

- ♦ 60 for paper from 60 to 80 g/m²
- ♦ 50 for paper from 75 to 90 g/m²

- ① Fan the paper, and then tap the edge against a flat surface to even the stack.

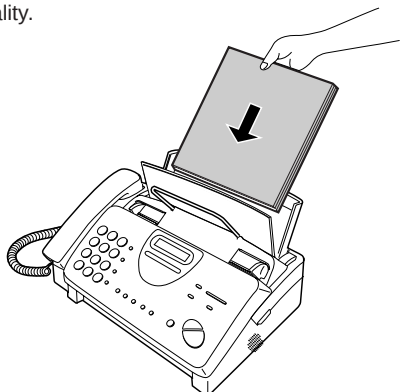


- ② Pull the paper release plate toward you.



③ Insert the stack of paper into the tray, **print side down**.

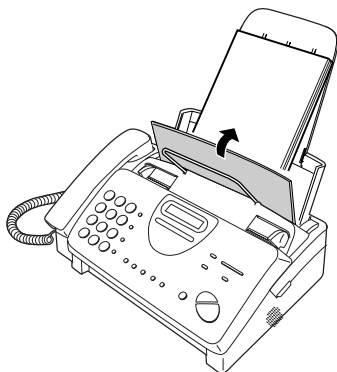
- If paper remains in the tray, take it out and combine it into a single stack with the new paper before adding the new paper.
- Be sure to load the paper so that printing takes place on the **print** side of the paper. Printing on the reverse side may result in poor print quality.



④ Push the paper release plate back down.

- If the paper release plate is not pushed down, paper feed errors will result.

Note: When receiving faxes or copying documents, do not allow a large number of pages to accumulate in the output tray. This may obstruct the outlet and cause paper jams.



⑤ Your fax has been set at the factory to print at normal contrast.

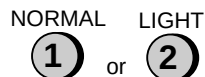
Depending on the type of paper you have loaded, you may find that you obtain better print quality by changing the setting to LIGHT.

Press these keys:



The display will show: PRINT CONTRAST

Press **1** to select NORMAL or **2** to select LIGHT.



The display will show: COPY CUT-OFF

Press the **STOP** key to return to the date and time display.



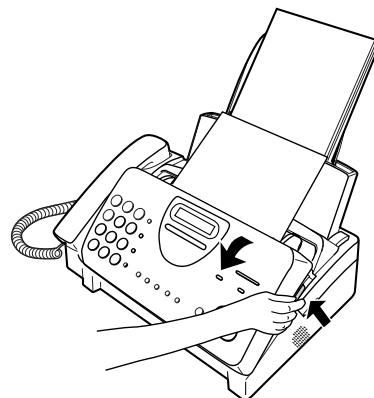
5. Clearing a jammed document

If the original document doesn't feed properly during transmission or copying, or DOCUMENT JAMMED appears in the display, first try pressing the **START** key. If it doesn't feed out, remove it as follows:.

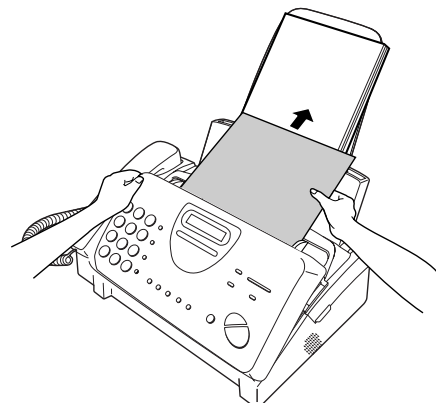
Important:

Do not try to remove a document without opening the operation panel. This may damage the feeder mechanism.

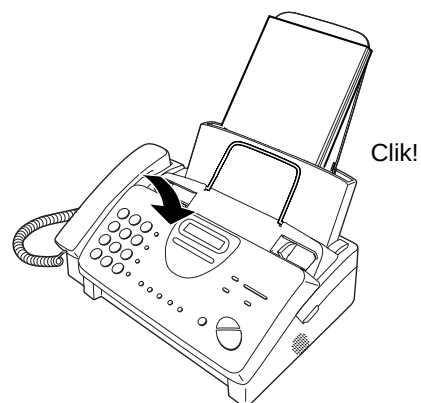
- ① Open the operation panel by grasping the finger hold and pulling up.



- ② Remove the document.

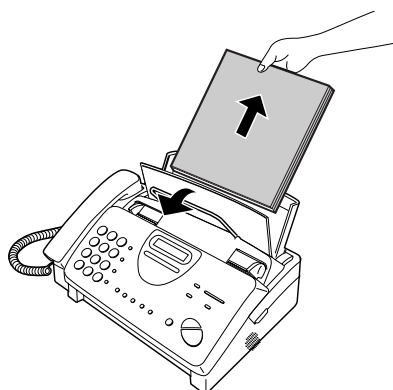


- ③ Close the operation panel, making sure it clicks into place.

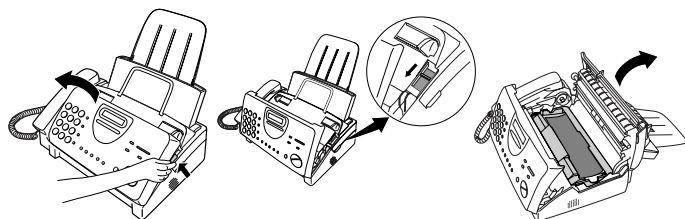


6. Clearing jammed printing paper

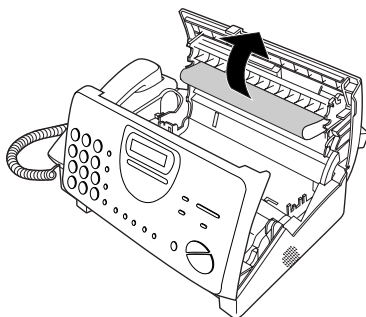
- ① Pull the paper release plate forward and remove the paper.



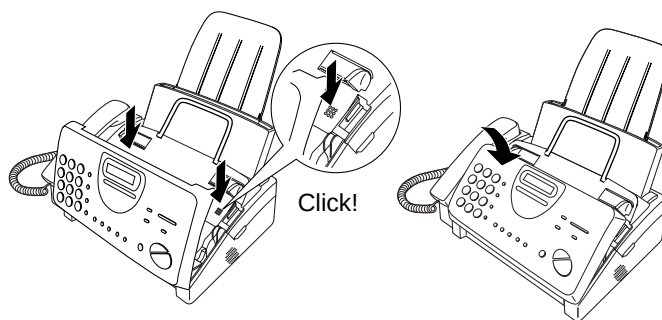
- ② Open the operation panel (grasp the finger hold and pull up), and then pull the release on the right side of the machine forward to open the print compartment cover.



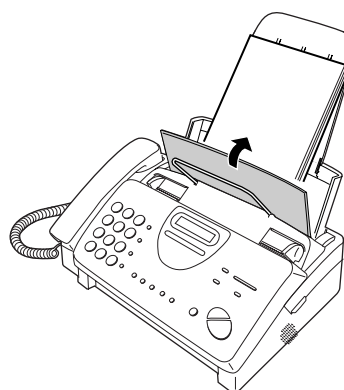
- ③ Gently pull the jammed paper out of the machine, making sure no torn pieces of paper remain in the print compartment or rollers.



- ④ Close the print compartment cover (press down on both sides to make sure it clicks into place), and then close the operation panel.

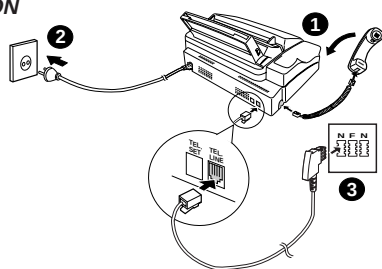


- ⑤ Replace the paper in the paper tray and push the paper release plate back down.



[5] Quick reference guide

INSTALLATION



1. Connect the handset as shown.
2. Plug the power cord into a grounded, 220-230 V outlet.
3. Plug one end of the telephone line into the **TEL. LINE** jack on the rear of the fax, and the other end into your telephone wall jack.

CONNECTING AN ANSWERING MACHINE AND/OR EXTENSION TELEPHONE

Germany:

The **TEL. SET** socket is not available on the fax.

We recommend that you plug the answering machine line cable into the right connector of the TAE wall outlet, a (e.g.: cordless) telephone into the middle connector and fax line cord into the left connector.

Switzerland, Austria:

An extension phone cannot be used. An answering machine can be used if it is connected to a wall socket (the **TEL. SET** socket is not available).

ENTERING YOUR NAME AND NUMBER

1. Press: **FUNCTION** **3** **#** **#**

Display shows: **OWN NUMBER SET**

2. Press: **START**

3. Enter your fax number (max. of 20 digits) by pressing the number keys.

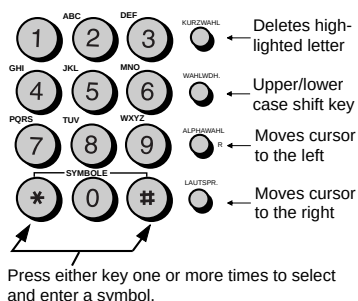
- ♦ If you make a mistake, press the **SEARCH/R** key to move the cursor back to the mistake, then enter the correct number or letter.

4. Press: **START**

5. Enter your name by pressing the appropriate number keys as shown below.

- ♦ To enter two letters in succession that require the same key, press the **SPEAKER** key after entering the first letter.

A = 2 2	J = 5 5	S = 7 7 7 7 7
B = 2 2 2	K = 5 5 5	T = 8 8
C = 2 2 2 2 2	L = 5 5 5 5	U = 8 8 8
D = 3 3	M = 6 6	V = 8 8 8 8
E = 3 3 3	N = 6 6 6	W = 9 9
F = 3 3 3 3	O = 6 6 6 6	X = 9 9 9
G = 4 4	P = 7 7	Y = 9 9 9 9
H = 4 4 4	Q = 7 7 7	Z = 9 9 9 9 9
I = 4 4 4 4	R = 7 7 7 7	SPACE = 1 1



6. When finished, press: **START** **STOP**

SETTING THE DATE AND TIME

- Press: **FUNCTION** **3** ***** ***** *****

Display shows: **DATE & TIME SET**

- Press the **START** key:

Enter two digits for the Day (01 through 31).

Enter two digits for the Month (01 through 12).

Enter four digits for the Year (Ex: 1999).

Enter two digits for the Hour (01 through 23).

Enter two digits for the Minute (00 through 59).

- When finished, press: **START** **STOP**

STORING AND CLEARING NUMBERS FOR AUTOMATIC DIALING

1. Press: **FUNCTION** **3** **#**

Display shows: **FAX/TEL # MODE**

2. Press **1** to store a number or **2** to clear a number.

3. Enter a 2-digit Speed Dial number (from 01 to 05 for Rapid Key Dialing, or 06 to 45 for Speed Dialing) (FO-730/NX-530 from 01 to 08 for Rapid Key Dialing, or 09 to 88 for Speed Dialing). (If you are clearing a number, go to Step 7.)

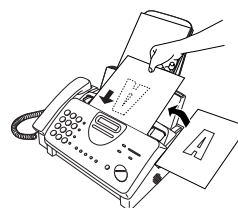
4. Enter the full telephone/fax number.

5. Press: **START**

6. Enter the name of the location by pressing number keys (max. of 20 characters). (Refer to the letter entry table in ENTERING YOUR NAME AND NUMBER.)

7. Press: **START** **STOP**

SENDING DOCUMENTS



Place your document (up to 10 pages) face down in the document feeder.

Normal Dialing

1. Lift the handset or press **LAUTSPR.**
2. Dial the fax number.
3. Wait for the reception tone (if a person answers, ask them to press their Start key).
4. Press: **START**

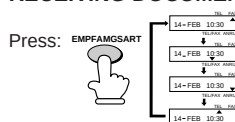
Rapid Key Dialing

Press the appropriate Rapid Key. Transmission will begin automatically.

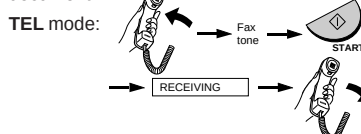
Speed Dialing

1. Press: **KURZWAHL**
2. Enter 2-digit Speed Dial number.
3. Press: **START**

RECEIVING DOCUMENTS



FAX mode: The fax automatically answers on four rings and receives the incoming document.



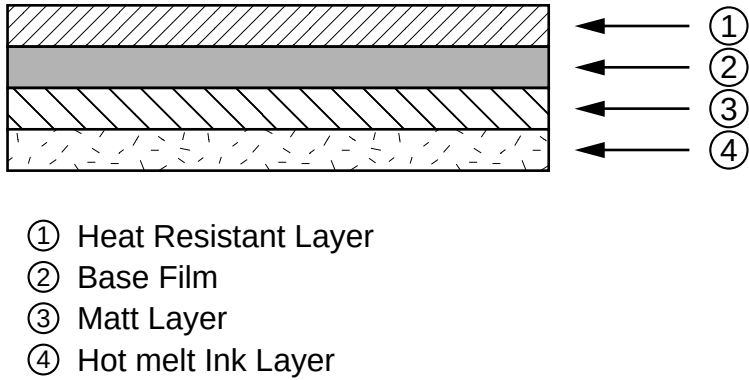
TEL/FAX mode: This mode is convenient for receiving both faxes and voice calls. When a call comes in, the fax will detect whether it is a voice call (including manually dialed fax transmissions), or an automatically dialed fax.

A.M. mode: Select this mode when an answering machine is connected to the fax and the answering machine is turned on.

[6] Option imaging film specifications
(UX-3CR)

1. Structure

This article is composed of polyester film coated with heat-resistant layer, matt layer and hot melt ink layer, leader film and paper core. Ink film specification is "DNP standard ink film HC".



2. Details of compositions

2-1. Base film

Heading	Requirements	Measuring method
Material	Polyethylene-terephthalate	—

2-2. Heat resistant layer

Heading	Requirements	Measuring method
Grade	HR Mixer P-5	—

2-3. Matt layer

Heading	Requirements	Measuring method
Grade	ML Sumi	—

2-4. Hot melt ink layer

Heading	Requirements	Measuring method
Grade	#507W	—

CHAPTER 2. ADJUSTMENTS

[1] Adjustments

General

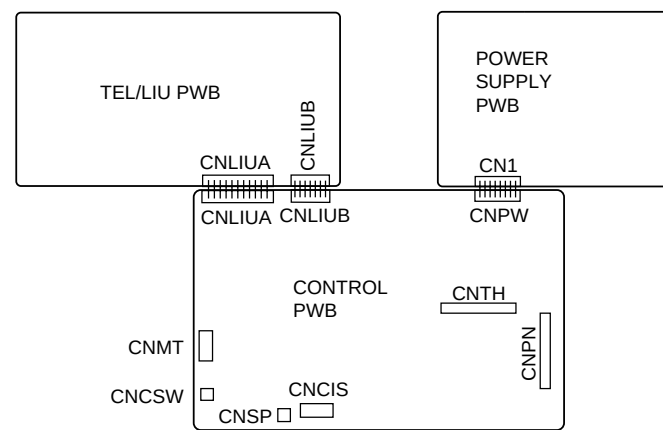
Since the following adjustments and settings are provided for this model, make adjustments and/or setup as necessary.

1. Adjustments

Adjustments of output voltage (FACTORY ONLY)

1. Install the power supply unit in the machine.
2. Set the recording paper and document.
3. When the document is loaded, power is supplied to the output lines.
Confirm that outputs are within the limits below.

Output voltage settings



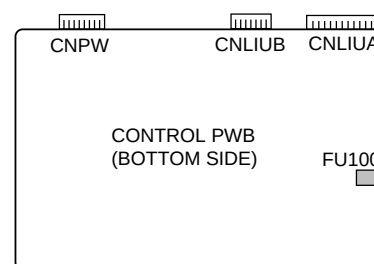
Output	Voltage limits
+5V	4.75V ~ 5.25V
+24V	23.3V ~ 24.7V

Connector No.	CNPW
Pin No.	
1	MG
2	MG
3	+24V
4	+24V
5	+24V
6	DG
7	+5V
8	DG
9	PSAVE

2. IC protectors replacement

ICPs (IC Protectors) are installed to protect the motor driver circuit. ICPs protect various ICs and electronic circuits from an overcurrent condition.

The location of ICPs are shown below:



- (1) FU100 (ICP-S07) is installed in order to protect IC's from an over-current generated in the motor drive circuit. If FU100 is open, replace it with a new one.

3. Settings

(1) Dial mode selector

DIAL mode (Soft Switch No. SWB4 DATA No. 3)

(step 1) Select "OPTION SETTING".

KEY : **FUNCTION** ④

DISPLAY: **OPTION SETTING** ⇌ **PRESS ✕ OR #**

(step 2) Select "DIAL MODE".

KEY: Push **#** until "**DIAL MODE**" is indicated because the number of **#**'s changes by the model.

Cursor
When initially registering, the mode shows 1=TONE. When registering again, the mode which was registered formerly is shown.

DISPLAY: **DIAL MODE** ⇌ **1=TONE, 2=PULSE**

(step 3) Select, using "1" or "2".

KEY: ①

DISPLAY: **TONE SELECTED**

KEY: ②

DISPLAY: **PULSE SELECTED**

(step 4) End, using the "STOP" key.

KEY:  STOP

[2] Diagnostics and service soft switch

1. Operating procedure

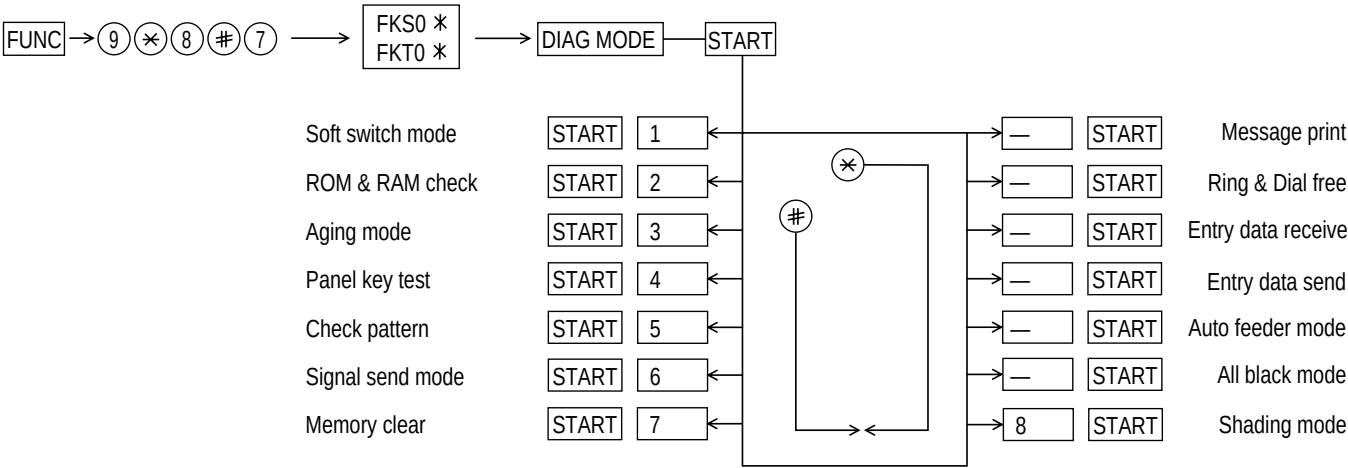
(1) Entering the diagnostic mode

Press **[FUNC]** → **[9]** → **[*]** → **[8]** → **[#]** → **[7]** , and the following display will appear.

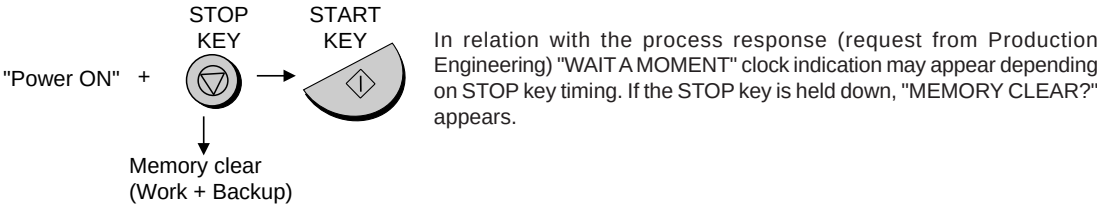
[ROM Ver. FKS0 X (FKT0 X)] After 2 sec: **[DIAG MODE]**

FKS0 X (UX-310DE)
FKT0 X (FO-730DE/NX-530DE)

Then press the **[START]** key. Select the desired item with the **[*]** key or the **[#]** key or select with the rapid key. Enter the mode with the START key.
(Diag•specifications)



If the diag mode cannot be set, repeat the diag mode operation, performing the following operation.
After the power is turned on and "WAIT A MOMENT" is indicated, press the STOP key.



2. Diagnostic items

ITEM No.	DIRECT key (UX-310)	DIRECT key (FO-730/NX-530)	Contents	Function
1	1	1	SOFT SWITCH MODE	Soft switches are displayed and changed. List can be output.
2	2	2	ROM & RAM CHECK	ROM is sum-checked, and RAM is matched. Result list is output.
3	3	3	AGING MODE	10 sheets of check patterns are output every 5 minutes per sheet.
4	4	4	PANEL KEY TEST	Panel keys are tested. Result list is output.
5	5	5	CHECK PATTERN	Check pattern is output.
6	—	6	SIGNAL SEND MODE	Various signals of FAX communication are output.
7	—	7	MEMORY CLEAR	Back-up memory is cleared, and is set at delivery.
8	—	8	SHADING MODE	Shading compensation is performed in this mode.
9	—	—	ALL BLACK PRINT	To check the print head, whole dots are printed over the interval of 2 m.
10	—	—	AUTO FEEDER MODE	Insertion and discharge of document are tested.
11	—	—	ENTRY DATA SEND	Registered content is sent.
12	—	—	ENTRY DATA RECEIVE	Registered content is received, and its list is output.
13	—	—	RING & DIAL FREE	Allows CI detection of 13Hz or more. Eliminates dial tone detection in auto dial.
14	—	—	MESSAGE PRINT	The display message of each language is printed out together with the English equivalent.

3. Diagnostic items description

3. 1. Soft switch mode

Used to change the soft switch settings.

The soft switch which is stored internally is set by using the keys.

The available soft switches are SW-A1 to SW-M2.

The content of soft switches is shown in page 2-5 to 2-16.

The contents are set to factory default settings.

3. 2. ROM & RAM check

ROM executes the sum check, and RAM executes the matching test. The result will be notified with the number of short sounds of the buzzer as well as by printing the ROM & RAM check list.

Number of short sounds of buzzer 0 → No error
 1 → ROM error
 2 → RAM error (32Kbyte)

3. 3. Aging mode

If any document is first present, copying will be executed sheet by sheet. If no document is present, the check pattern will be printed sheet by sheet. This operation will be executed at a rate of one sheet per 5 minutes, and will be ended at a total of 10 sheets.

3. 4. Panel key test

This mode is used to check whether each key operates properly or not. Press the key on the operation panel, and the key will be displayed on the display. Therefore, press all keys. At this time, finally press the STOP key.

When the STOP key is pressed, the keys which are not judged as "pressed" will be printed on the result list.

- LED port of the contact image sensor (CIS) is kept on during the term from when start of the panel test mode to end with the STOP key.

3. 5. Check pattern

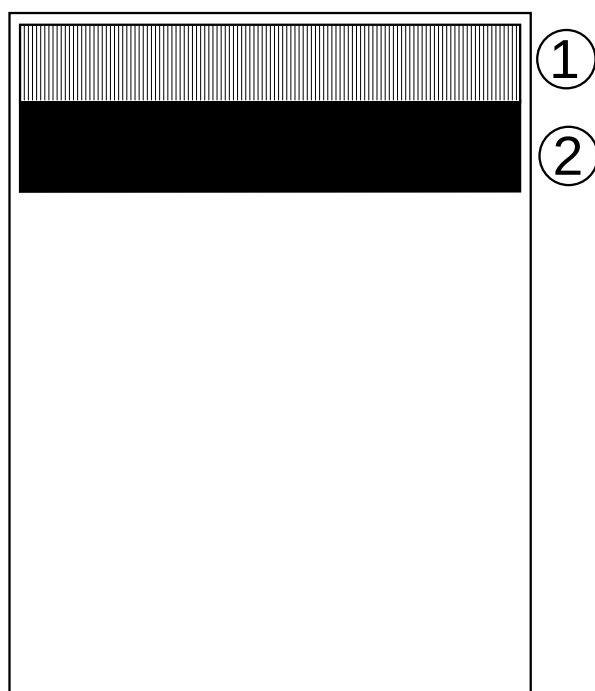
This mode is used to check the state of the printing head. It is ended with the following pattern printed on one printing sheet.

- ① Longitudinal stripe 2 Approx. 30 mm

2 black dots and 2 white dots are repeatedly progressed on one line.

- ② Full black

Approx. 30 mm



3. 6. Signal send mode

This mode is used to send various signals to the circuit during FAX communication. Every push of START key sends a signal in the following sequence. Moreover, the signal sound is also output to the speaker when the line monitor of the soft switch is on.

- [1] No signal (CML signal turned on)
- [2] 9600bps
- [3] 7200bps
- [4] 4800bps
- [5] 2400bps
- [6] 300bps (FLAG)
- [7] 2100Hz (CED)
- [8] 1100Hz (CNG)
- [9] END

3. 7. Memory clear

This mode is used to clear the backup memory and reset to the default settings.

3. 8. Shading mode

The mode is used for the shooting compensation. For reading, set up the special original paper.

The shooting compensation memorizes the reference data of white and black for reading.

Moreover, the memorized data is not erased even if memory clear mode is executed.

3. 9. All black print

This mode is used to check the state of the printing head and intentionally overheat it. Whole dots are printed over the interval of 2 m. If it is overheated or the printing sheet is jammed, press STOP key for the end.

3. 10. Auto feeder mode

In this mode, a document is inserted and discharged to check the auto feed function.

After this mode is started, set a document, and the document feed will be automatically tested.

3. 11. Entry data send

This mode is used to send the registered data to the other machine and make the other machine copy the registered content.

Before sending in this mode, it is necessary to set the other machine at the entry data receive mode.

The following information will be sent to the remote machine:

- 1. Telephone list data
- 2. Sender register data
- 3. Optional setting content
- 4. Soft switch content
- 5. Junk fax number list
- 6. Timer reservation data (only on the model which timer reservation is possible)
- 7. Recording setting list data

3. 12. Entry data receive

In this mode, the registered data sent from the other machine is received and the received data is registered in the machine. When this mode is used for receiving, the other machine must be in the entry data send mode.

After receiving is completed, the following lists are printed.

- 1. Telephone list data
- 2. Sender register data (The passcode No. is also printed if the polling function is provided.)
- 3. Optional setting list
- 4. Soft switch content
- 5. Junk fax number list
- 6. Timer reservation list (only model which timer communication is possible)
- 7. Recording setting list data

4. How to make soft switch setting

To enter the soft switch mode, make the following key entries in sequence.

Press FUNCTION 9 * 8 # 7 START START

DATA No. 1 2 3 4 5 6 7 8

S F T SW-A1 = 0 0 0 0 0 0 0 0

S F T SW-A1 = 1 0 0 0 0 0 0 0

S F T SW-A1 = 1 0 0 0 0 0 0 0

S F T SW-A1 = 1 0 0 0 0 0 0 0

S F T SW-A1 = 1 0 0 0 0 0 0 0

S F T SW-A2 = 0 0 0 0 0 0 0 0

S F T SW-M2 = 0 0 0 0 0 0 0 0

Press FUNCTION key.

Press # key.

Press * key.

Bit1 - 8 are set.

Press START key during setting.

Soft SW-A2 - SW-M2 are set.

• To finish the settings halfway between SW-A1 and SW-M2, press the STOP key. In this case, the setting being done to the SW No. on display will be nullified while settings done to the preceding SW Nos. remain in effect.

• When the COPY key is pressed, the contents of soft switches are printed.

The soft switch mode is terminated.

3. 13. Ring & Dial free

Used to reject dial tone check while autodialing is carried out. And used to change the bottom Ring frequency of auto-receiving to 13Hz.

3. 14. Message print

Used to print the displayed message of communication for translate each language.

2 – 4

5. Soft switch description

• Soft switch

SW NO.	DATA NO.	ITEM	Switch setting and function				Initial setting								Remarks	
			1		0		DE									
SW I A1	1	Protect from echo	No		Yes		0									
	2	Forced 4800 BPS reception	Yes		No		0									
	3	Footer print	Yes		No		0									
	4	Length limitation of copy/send/receive	No limit		Copy/send: 60cm Receive: 1.5m		0									
	5	CSI transmission	No transmitted		Transmitted		0									
	6	DIS receive acknowledgement during G3 transmission	Twice		NSF: Once DIS: Twice		0									
	7	Non-modulated carrier for V29 transmission modem	Yes		No		0									
	8	EOL detect timer	25 s		13 s		0									
SW I A2	1 2 3 4	Modem speed		V.29		V.27 ter		0								
				9600	7200	4800	2400									
			No. 1	0	0	0	0									
			No. 2	0	0	0	0									
			No. 3	0	1	1	0									
	5	Sender's information transmit	No		Yes		0									
	6	Reserved					0									
	7	Communication error treatment in RTN sending mode (reception)	No communication error		Communication error		0									
8	CNG transmission	No		Yes		0										
SW I A3	1 2	CED tone signal interval		1000ms	750ms	500ms	75ms	0								
			No. 1	1	1	0	0									
			No. 2	1	0	1	0									
	3	MR coding	No		Yes		0									
	4	Reserved					0									
	5	Reserved					0									
	6	Reserved					0									
	7	Reserved					0									
8	Reserved					0										
SW I A4	1	Signal transmission level	Binary input				0									
	2		No. = 16 8 4 2 1				1									
	3		1 2 3 4 5				0									
	4		0 1 0 1 1				1									
5					1											
6	Protocol monitor (error print)	Printed at com. error		Not printed		0										
7	Protocol monitor	Yes		No		0										
8	Line monitor	Yes		No		0										
SW I A5	1 2	Digital line equalization setting (Reception)		7.2km		0km		1								
			No. 1	1		0										
			No. 2	1		0										
	3	Reserved					0									
	4	Reserved					0									
	5 6	Digital cable equalizer setting (Reception for Caller ID)		7.2km		0km		0								
			No. 5	1		0										
			No. 6	1		0										
7	Error criterion	10 ~ 20 %		5 ~ 10 %		0										
8	Anti junk fax check	Yes		No		0									OPTION	

SW NO.	DATA NO.	ITEM	Switch setting and function				Initial setting								Remarks	
			1		0		DE									
SW I A6	1	Auto gain control (MODEM)	Enable		Disable		1									
	2	End Buzzer	Yes		No		1									
	3	Disconnect the line when DIS is received in RX mode	No		Yes		1									
	4	Equalizer freeze control (MODEM)	On		Off		0									
	5	Equalizer freeze control 7200 BPS only	No		Yes		0									
	6	CNG transmission in manual TX mode	Yes		No		1									
	7	Reserved					0									
	8	Reserved					0									
SW I B1	1	Reserved					0									
	2	Reserved					0									
	3	Reserved					0									
	4	Reserved					0									
	5	Recall times	Binary input No. = 8 4 2 1				0									
	6		5 6 7 8				0									
	7		0 0 1 0				1									
	8						0									
SW I B2	1	Dial pausing (sec/pause)	4 sec		2 sec		1									
	2	Dial tone detection (before auto dial)	No		Yes		0									
	3	Reserved					0									
	4	Busy tone detection (after auto dial)	No		Yes		0									
	5	Reserved					0									
	6	Reserved					0									
	7	Reserved					0									
	8	PBX connection	Yes		No		0									OPTION
SW I B3	1 2	PBX recall function (R key select)		No.	Earth	Flash										OPTION
			No. 1	0	1	1	1									
			No. 2	0	0	1	1									
	3	Reserved					0									
	4 5	PBX select		ID	Earth	Flash										OPTION
			No. 4	0	1	1	0									
			No. 5	0	0	1	0									
	6	Reserved					0									
7	Reserved					0										
8	Reserved					0										
SW I B4	1	Reserved					0									
	2	Reserved					0									
	3	Dial mode	Tone		Pulse		1									OPTION
	4	Pulse → Tone change function by ✕ key	Enable		Disable		1									
	5	Reserved					0									
	6	Reserved					0									
	7	PBX type	ISDN		NORMAL		0									OPTION
	8	Reserved					0									

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting								Remarks	
			1		0			DE									
SW I B5	1	DTMF signal transmission level (Low)	Binary input					1									
	2		No. = 16 8 4 2 1					1									
	3		1 2 3 4 5					0									
	4		1 1 0 1 0					1									
	5							0									
	6	Reserved						0									
	7	Reserved						0									
	8	Reserved						0									
SW I B6	1	DTMF signal transmission level (High)	Binary input					1									
	2		No. = 16 8 4 2 1					1									
	3		1 2 3 4 5					0									
	4		1 1 0 0 0					0									
	5							0									
	6	Reserved						0									
	7	Reserved						0									
	8	Reserved						0									
SW I C1	1 2	Reading slice (Binary)		Factory setting	Light	Dark	Darker in dark mode	0 0									
			No. 1	0	1	0	1										
			No. 2	0	0	1	1										
	3 4	Reading slice (Half tone)		Factory setting	Light	Dark	Darker in dark mode	0 0									
			No. 3	0	1	0	1										
			No. 4	0	0	1	1										
	5	Line density selection	Fine		Standard			0								OPTION	
	6	Halftone gray scale selection	16 level		64 level			0								OPTION	
7	MTF correction in half tone mode	No		Yes			0										
8	Reserved						0										
SW I D1	1	Number of rings for auto receive	Binary input					0								OPTION	
	2		No. = 8 4 2 1					0									
	3		1 2 3 4					0									
	4		0 0 0 1					1									
	5	Automatic switching manual to auto receive mode	Reception after 5 rings		No reception			0									
6	Reserved						0										
7	CI detection	13 Hz or more		As is PTT			0										
8	Reserved						0										
SW I D2	1	Reserved						0									
	2	Reserved						0									
	3	Reserved						0									
	4	Reserved						0									
	5	Caller ID function	Yes		No			0								OPTION	
	6	Reserved						0									
	7	Reserved						0									
	8	Caller ID detect during CI off	All times		Only first			1									
SW I E1	1	Tel/Fax Automatic switching mode	Tel/Fax auto switch		Switch to Fax			1									
	2	Pseudo ringing time at phone/fax automatic switching mode		15sec	60sec	30sec	120sec	0 0 0								OPTION	
	No. 2		0	0	1	1											
	No. 3		0	1	0	1											
	4	Number of CNG signal detection at the tel/fax automatic switching mode	Twice		Once			1									
	5	Reserved						0									
	6	Reserved						0									
	7	Post answer tone (transmit in Tel/Fax mode)	No		Yes			0									
8	Reserved						0										

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting								Remarks
			1		0			DE								
SW I E2	1	Pseudo ringer sound volume	Binary input					0								
	2		No. = 8 4 2 1					1								
	3		1 2 3 4					0								
	4		0 1 0 1					1								
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								
	8	Reserved						0								
SW I F1		DTMF detection time		50ms	80ms	100ms	120ms									
	1		No. 1	0	0	1	1	0								
	2		No. 2	0	1	0	1	0								
	3	Protection of remote reception (5 XX) detect	Yes			No		0								OPTION
	4	Remote reception with GE telephone	Compatible			Not compatible		1								
	5	Remote operation code figures by external TEL (0~9)	Binary input					0								OPTION
	6		No. = 8 4 2 1					1								
	7		5 6 7 8					0								
8	0 1 0 1					1										
SW I F2	1	CNG detection in STAND-BY mode	Yes			No		1								OPTION
		Number of CNG detect (AM mode)		1pulse	2pulses	3pulses	4pulses									
	2		No. 2	0	0	1	1	0								
	3		No. 3	0	1	0	1	1								
	4	Number of CNG (STAND-BY mode)		1pulse	2pulses	3pulses	4pulses									
			No. 4	0	0	1	1	0								
	5		No. 5	0	1	0	1	1								
	6	Reserved						0								
7	Reserved						0									
	8	Reserved						0								
SW I G1	1	Quiet detect time	Binary input					0								OPTION
	2		No. = 8 4 2 1					1								
	3		1 2 3 4					1								
	4		0 1 1 0					0								
	5	Quiet detect start timing	Binary input					0								OPTION
	6		No. = 8 4 2 1					0								
	7		5 6 7 8					0								
	8		0 0 0 0					0								
SW I G2	1	Off hook hold	Binary input					0								OPTION
	2		No. = 128 64 32 16 8 4 2 1					0								
	3		1 2 3 4 5 6 7 8					0								
	4		0 0 0 0 0 0 0 0					0								
	5		0													
	6		0													
	7		0													
	8		0													
SW I G3		OGM detect timer		Not Work	100ms	200ms	300ms									
	1		No. 1	0	0	1	1	0								
	2		No. 2	0	1	0	1	1								
	3	Reserved						0								
	4	Reserved						0								
		Section time of quiet detection		30s	40s	50s	60s									
	5		No. 5	0	0	1	1	0								
	6		No. 6	0	1	0	1	1								
7	Reserved						0									
8	Reserved						0									

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting								Remarks
			1		0			DE								
SW H1	1	Reserved						0								
	2	Reserved						0								
	3	Reserved						0								
	4	Busy tone continuous sound detect time	5 sec		As is PTT			1								
	5	Reserved						0								
	6	Busy tone detect continuation sound detect (during ICM : for internal A.M.)	No		Yes			0								
	7	Reserved						0								
	8	Busy tone detect intermittent sound detect (during ICM : for internal A.M.)	No		Yes			0								
SW H2	1	Busy tone detection pulse number		2pulses	4pulses	6pulses	10pulses									
			No. 1	0	0	1	1	0								
			No. 2	0	1	0	1	1								
	3	Fax switching when A.M. full	Yes		No			0								OPTION
	4	Reserved						0								
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								
SW I1	8	Reserved						0								
	1	Reserved						0								
	2	Reserved						0								
	3	Reserved						0								
	4	Reserved						0								
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								
SW I2	8	Reserved						0								
	1	Reserved						0								
	2	Reserved						0								
	3	Reserved						0								
	4	Reserved						0								
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								
SW I3	8	Reserved						0								
	1	Reserved						0								
	2	Reserved						0								
	3	Reserved						0								
	4	Reserved						0								
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								
SW I4	8	Reserved						0								
	1	Reserved						0								
	2	Reserved						0								
	3	Reserved						0								
	4	Reserved						0								
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting								Remarks
			1		0			DE								
SW I 15	1	Reserved						0								
	2	Reserved						0								
	3	Reserved						0								
	4	Reserved						0								
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								
	8	Reserved						0								
SW I 16	1	Reserved						0								
	2	Reserved						0								
	3	Reserved						0								
	4	Reserved						0								
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								
	8	Reserved						0								
SW I 17	1	Reserved						0								
	2	Reserved						0								
	3	Reserved						0								
	4	Reserved						0								
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								
	8	Reserved						0								
SW I J1	1	Activity report print	Automatic printout		No printout when memory full			0								OPTION
	2	Total communication hours and pages print	No		Yes			0								
	3	Sender's phone number setting	Cannot change		Change allowed			0								
	4	Reserved						0								
	5	Reserved						0								
	6	Summer time setting	No		Yes			0								
	7	Ringer volume		Off	Low	Middle	High	1								OPTION
	8		No. 7	0	0	1	1									
SW I J2	1	Speaker volume (3 stages)		Low	Low	Middle	High	1								OPTION
	2		No. 1	0	0	1	1									
	3		No. 2	0	1	0	1									
	4	Polling key	Yes		No			0								OPTION
	5	Reserved						0								
	6	Reserved						0								
	7	Reserved						0								
	8	Reserved						0								
SW I J3	1	Automatic cover sheet	Yes		No			0								OPTION
	2	Communication results printout (Transaction report)		E/T/M	Send only	Always	No print	Err only	1							OPTION
	3		No. 2	0	0	0	0	1								
	4		No. 3	0	0	1	1	0								
	5		No. 4	0	1	0	1	0								
	6	Reserved						0								
	7	Reserved						0								
	8	Reserved						0								

SW NO.	DATA NO.	ITEM	Switch setting and function				Initial setting								Remarks
			1		0		DE								
SW I K1	1	Entering DIAG mode by pressing SPEED key	Yes		No		0								
	2	Reserved					0								
	3	Reserved					0								
	4	Reserved					0								
	5	Reserved					0								
	6	Reserved					0								
	7	Reserved					0								
	8	Reserved					0								
SW I L1	1	Reserved					0								
	2	Reserved					0								
	3	Reserved					0								
	4	Reserved					0								
	5	Cut off mode (COPY mode)	Yes		No		1								OPTION
	6	A4 paper enable	Enable		Disable		1								
	7	LEGAL & LETTER paper enable	Enable		Disable		0								
	8	Reserved					0								
SW I L2	1 2	Paper set size		LETTER	LEGAL	A4	1 0								
			No.1	0	0	1									
			No.2	0	1	0									
	3	Automatic reduce of receive	Auto		100 %		1								OPTION
	4	Print contrast	Light		Normal		0								OPTION
	5	Reception reduction ratio in case of memory full	100 %		93 %		0								OPTION
	6	Reserved					0								
	7	Reserved					0								
8	Reserved					0									
SW I M1	1	Reserved					0								
	2	Reserved					0								
	3	Reserved					0								
	4	Reserved					0								
	5	Reserved					0								
	6	Reserved					0								
	7	Reserved					0								
	8	Reserved					0								
SW I M2	1	Reserved					0								
	2	Reserved					0								
	3	Reserved					0								
	4	Reserved					0								
	5	Reserved					0								
	6	Reserved					0								
	7	Reserved					0								
	8	Reserved					0								

• Soft switch function description

SW-A1 No. 1 Protect from echo

Used to protect from echo in reception.

SW-A1 No. 2 Forced 4800BPS reception

When line conditions warrant that receptions take place at 4800 BPS repeatedly.

It may improve the success of receptions by setting at 4800BPS.

This improve the receiving document quality and reduces handshake time due to fallback during training.

SW-A1 No. 3 Footer print

When set to "1", the date of reception, the sender machine No., and the page No. are automatically recorded at the end of reception.

SW-A1 No. 4 Length limitation of copy/send/receive

Used to set the maximum page length.

To avoid possible paper jam, the page length is normally limited to 0.6 meter for copy or transmit, and 1.5 meters for receive.

It is possible to set it to "No limit" to transmit a long document, such as a computer print form, etc. (In this case, the receiver must also be set to no limit.)

SW-A1 No. 5 CSI transmission

(CSI TRANSMISSION) is a switch to set whether the machine sends or does not send the signal (CSI signal) informing its own telephone No. to the remote fax. machine when information is received. When "nonsending" is set, the telephone No. is not output on the remote transmitting machine if the remote transmitting machine has the function to display or print the telephone No. of receiving machine, using this CSI signal.

SW-A1 No. 6 DIS receive acknowledgment during G3 transmission

Used to make a choice of whether reception of DIS (NSF) is acknowledged after receiving two DISs (NSFs) or receiving one DIS (two NSF). It may be useful for overseas communication to avoid an echo suppression problem, if set to 1.

SW-A1 No. 7 Non-modulated carrier for V29 transmission modem

Though transmission of a non-modulated carrier is not required for transmission by the V29 modem according to the CCITT recommendation, it may be permitted to a send non-modulated carrier before the image signal to avoid and echo suppression problem. It may be useful for overseas communication to avoid an echo suppression problem, if set to 1.

SW-A1 No. 8 EOL (End Of Line) detect timer

Used to make a choice of whether to use the 25-second or 13-second timer for detection of EOL.

This is effective to override communication failures with some facsimile models that have longer EOL detection.

SW-A2 No. 1 ~ No. 4 Modem speed

Used to set determine the initial modem speed. The default is 9600BPS. It may be necessary to program it to a slower speed when frequent line fallback is encountered, in order to save the time required for fallback procedure.

SW-A2 No. 5 Sender's information transmit

(SENDER'S INFORMATION TRANSMISSION) is a switch to set the function to print the content of HEADER PRINT described in the passcode list at the front end of receiver's original when original is sent to the remote machine.

If this switch is set to "NO", the HEADER PRINT is not output at the receiving machine.

SW-A2 No. 6 Reserved

Set to "0".

SW-A2 No. 7 Communication error treatment in RTN sending mode (Reception)

Used to determine communication error treatment when RTN is sent by occurrence of a received image error in G3 reception. When it is set to "1", communication error is judged as no error.

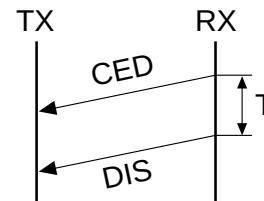
SW-A2 No. 8 CNG transmission

When set to "0", this model allows CNG transmission by pressing the Start key in the key pad dialing mode. When set to "1", CNG transmission in the key pad dialing mode cannot be performed. In either case, CNG transmission can be performed in the auto dial mode.

SW-A3 No. 1, No. 2 CED tone signal interval

For international communication, the 2100Hz CED tone may act as an echo suppression switch, causing a communication problem.

Though SW-A3 No. 1 and No. 2 are normally set to 0, it should be changed this time between the CED tone signal to eliminate the communication problem caused by echo.



SW-A3 No. 3 MR Coding

Used to select the MR coding enable or disable.

SW-A3 No. 4 ~ No. 8 Reserved

Set to "0".

SW-A4 No. 1 ~ No. 5 Signal transmission level

Used to control the signal transmission level in the range of 0dB to -31dB.

The factory setting is at -11dB (MODEM output).

SW-A4 No. 6 Protocol monitor (Error print)

If set to "1", protocol is printed at communication error.

SW-A4 No. 7 Protocol monitor

Normally set to "0". If set to "1", communication can be checked, in case of troubles, without using a G3 tester or other tools.

When communication FSK data transmission or reception is made, the data is taken into the buffer. When communication is finished, the data is analyzed and printed out. When data is received with the line monitor (SW-A4 No. 8) set to "1" the reception level is also printed out.

SW-A4 No. 8 Line monitor

Normally set to "0". If set to "1", the transmission speed and the reception level are displayed on the LCD. Used for line tests.

SW-A5 No. 1, No. 2 Digital line equalization setting (Reception)

Line equalization when reception is to be set according to the line characteristics.

Setting should be made according to distance between the telephone and the telephone company central switching station.

SW-A5 No. 3, No. 4 Reserved

Set to "0".

SW-A5 No. 5, No. 6 Digital cable equalizer setting (Reception for Caller ID)

Line equalization when reception for CALLER ID is to be set according to the line characteristics.

Setting should be made according to distance between the telephone and the telephone company central switching station.

SW-A5 No. 7 Error criterion

Used to select error criterion for sending back RTN when receiving image data.

SW-A5 No. 8 Anti junk fax check

When use the Anti junk fax function, set to "1".

SW-A6 No. 1 Auto gain control (MODEM)

When this mode is enabled, if the reception signal level is under 31dBm. The modem itself controls the signal gain automatically.

SW-A6 No. 2 End buzzer

Setting this bit to 0 will disable the end buzzer (including the error buzzer/on-hook buzzer).

SW-A6 No. 3 Disconnect the line when DIS is received in RX mode

Bit1= 0: When DIS signal is received during RX mode, disconnected the line is immediately.

Bit1= 1: When DIS signal is received during RX mode, wait the next signal.

SW-A6 No. 4 Equalizer freeze control (MODEM)

This switch is used to perform reception operation by fixing the equalizer control of modem for the line which is always in unfavorable state and picture cannot be received.

* Usually, the control is executed according to the state of line where the equalizer setting is changed always.

SW-A6 No. 5 Equalizer freeze control 7200BPS only

Setting which specifies SW-A3 No. 6 control only in the condition of 7200BPS modem speed.

SW-A6 No. 6 CNG transmission in manual TX mode

When set to "1", fax transmit the CNG signal in case of manual transmission mode (User press the START key after waiting the fax answering signal from handset or speaker).

SW-A6 No. 7, No. 8 Reserved

Set to "0".

SW-B1 No. 1 ~ No. 4 Reserved

Set to "0".

SW-B1 No. 5 ~ No. 8 Recall times

Choice is made as to how many redials should be.

SW-B2 No. 1 Dialing pause (sec/pause)

Pauses can be inserted between telephone numbers of direct dial connection. Selection of 4 sec or 2 sec pause is available.

SW-B2 No. 2 Dial tone detection (before auto dial)

Used to set YES/NO of dial tone detection in auto dialing.

SW-B2 No. 3 Reserved

Set to "0".

SW-B2 No. 4 Busy tone detection (after auto dial)

Used to set YES/NO of busy tone detection after auto dialing.

SW-B2 No. 5 ~ No. 7 Reserved

Set to "0".

SW-B2 No. 8 PBX connection

Used to select according to the connected line: PBX (Private Branch Exchange).

SW-B3 No. 1, No. 2 PBX recall function (R key select)

Used to set the operation mode of PBX recall when the R key is pressed. Setting is made according to the type of PBX.

No. 1=1, No. 2=1: Time break recall (=Flash) is performed.

No. 1=1, No. 2=0: Earth recall is performed.

SW-B3 No. 3 Reserved

Set to "0".

SW-B3 No. 4, No. 5 PBX select

Used to select the operation mode of PBX recall in auto dialing.

No. 4=1, No. 5=1: Time break recall (=Flash) is performed before dialing.

No. 4=1, No. 5=0: Earth recall is performed before dialing.

No. 4=0, No. 5=0: The PBX ID digit is automatically added when dialing to external line. PBX ID is up to 3 digits and entered in Option settings mode.

SW-B3 No. 6 ~ No. 8 Reserved

Set to "0".

SW-B4 No. 1, No. 2 Reserved

Set to "0".

SW-B4 No. 3 Dial mode

When using the pulse dial, set to 0. When using the tone dial, set to 1.

SW-B4 No. 4 Pulse → Tone change function by ✕ key

When setting to 1, the mode is changed by pressing the ✕ key from the pulse dial mode to the tone dial mode.

SW-B4 No. 5, No. 6 Reserved

Set to "0".

SW-B4 No. 7 PBX type

Used to select type of PBX

"0": NORMAL

"1": ISDN

SW-B4 No. 8 Reserved

Set to "0".

SW-B5 No. 1 ~ No. 5 DTMF signal transmission level (Low)

The transmission level of DTMF signal is adjusted. (lower frequency)

00000: 0dBm

↓

11111: -15.5dBm (-0.5dBm x 31)

SW-B5 No. 6 ~ No. 8 Reserved

Set to "0".

SW-B6 No. 1 ~ No. 5 DTMF signal transmission level (High)

The transmission level of DTMF signal is adjusted. (higher frequency)

00000: 0dBm

↓

11111: -15.5 dBm (-0.5dBm x 31)

SW-B6 No. 6 ~ No. 8 Reserved

Set to "0".

SW-C1 No. 1, No. 2 Reading slice (Binary)

Used to determine the set value of reading density in standard/fine mode. The standard setting is "00" (Factory setting is "00")

SW-C1 No. 3, No. 4 Reading slice (Half tone)

Used to determine the set value of reading density in half tone mode. The standard setting is "00" (Factory setting is "00")

SW-C1 No. 5 Line density selection

Used to set the transmission mode which is automatically selected when the Resolution key is not pressed. In the copy mode, however, the fine mode is automatically selected unless the Resolution key is manually set to another mode.

SW-C1 No. 6 Half tone gray scale selection

Used to determine the reading gray scale in half tone mode.

When set to "0", gray scale is 64 levels.

When set to "1", gray scale is 16 levels.

SW-C1 No. 7 MTF correction in half tone mode

This allows selection of MTF correction (dimness correction) in the half tone mode.

When "NO" (=1) is selected, the whole image becomes soft and mild. On the contrary, however, clearness of characters will be reduced. Normally set to "YES" (=0).

SW-C1 No. 8 Reserved

Set to "0".

SW-D1 No. 1 ~ No. 4 Number of rings for auto receive

When the machine is set in the auto receive mode, the number of rings before answering can be selected. It may be set from one to four rings using a binary number. Since the facsimile telephone could be used as an ordinary telephone if the handset is taken off the hook, it should be programmed to the user's choice. If the soft switch was set to 1, direct connection is made to the facsimile. If a facsimile calling beep was heard when the handset is taken off the hook, press the START key and put the handset on the hook to have the facsimile start receiving. If it was set to 0 accidentally, receive ring is set to 1.

NOTE: If the machine is set to answer after a large number of rings, it may not be able to receive faxes successfully. If you have difficulty receiving faxes, reduce the number of rings to a maximum of 5.

SW-D1 No. 5 Automatic switching manual to auto receive mode

This soft switch is used to select whether the machine should switch to the auto receive mode after 5 rings in the manual receive mode or remain in the same way as SW-D1 No. 1, No. 2, No. 3 and No. 4 "0"1"0"1"(5 rings).

SW-D1 No. 6 Reserved

Set to "0".

SW-D1 No. 7 CI detection

Detection frequency of ring signal for auto reception is set. When set to 1, frequency is set to 13Hz or more.

SW-D1 No. 8 Reserved

Set to "0".

SW-D2 No. 1 ~ No. 4 Reserved

Set to "0".

SW-D2 No. 5 Caller ID function

Used for Caller ID function.

SW-D2 No. 6, No.7 Reserved

Set to "0".

SW-D2 No. 8 Caller ID detect during CI off

Detection of caller ID signal is performed as follows:

0 : First CI OFF only

1 : All of CI OFF

SW-E1 No. 1 Tel/Fax Automatic switching mode

Used to set automatic TEL/FAX switching mode or to set the normal fax mode.

SW-E1 No. 2, No. 3 Pseudo ringing time at the tel/fax automatic switching mode

Choice is made as to how long to rumble the dummy ringer on TEL/FAX automatic switching mode.

SW-E1 No. 4 Number of CNG signal detection at the tel/fax automatic switching mode

Used for detection of CNG in one tone or two tones in the TEL/FAX automatic switching mode.

SW-E1 No. 5, No. 6 Reserved

Set to "0".

SW-E1 No. 7 Post answer tone (transmit in Tel/Fax mode)

When set to "0", machine send the 800 Hz tones in TEL/FAX auto changeover mode.

SW-E1 No. 8 Reserved

Set to "0".

SW-E2 No. 1 ~ No. 4 Pseudo ringer sound volume

Used to adjust sound volume of pseudo ringer to the line (ring back tone) generated on selecting TEL/FAX. Setting is the reduce level from -5dBm output level.

SW-E2 No. 5 ~ No. 8 Reserved

Set to "0".

SW-F1 No. 1, No. 2 DTMF detect time

Used to set detect time of DTMF (Dual Tone Multi Frequency) used in remote reception (5 × ×).

The longer the detect time is, the less the error detection is caused by noises.

SW-F1 No. 3 Protection of remote reception (5 × ×) detect

Used to set the function of remote reception (5 × ×). When set to "1", the remote reception function is disabled.

SW-F1 No. 4 Remote reception with GE telephone

(Corresponding to TEL made by GE) P. B. X.

"1": Compatible with TEL mode by GE

"0": Not compatible

- When sending (5 × ×) for remote reception with a GE manufactured telephone remote reception may not take place because of special specifications in their DTMF.
To overcome this, a soft SW is provided to change the modem setting to allow for remote reception.

- If this soft SW is set to "1", other telephone sets may be adversely affected.

SW-F1 No. 5 ~ No. 8 Remote operation code figures by external TEL (0 ~ 9)

Remote operation codes can be changes from 0 through 9. If set to greater than 9, it defaults to 9. The "5 × × " is not changed.

Ex-7 × × (Default: 5 × ×)

SW-F2 No. 1 CNG detection in STAND-BY mode

When setting to "1", the CNG signal detection function during standby stops.

SW-F2 No. 2, No. 3 Number of CNG detect (AM mode)

Used for detection of CNG in 1 to 4 pulses.

SW-F2 No. 4, No. 5 Number of CNG (STAND-BY mode)

Used for detection of CNG in 1 to 4 pulses.

SW-F2 No. 6 ~ No. 8 Reserved

Set to "0".

SW-G1 No. 1 ~ No. 4 Quiet detect time

When an answering machine is connected, if a no sound state is detected for a certain period of time, the machine judges it as a transmission from a facsimile machine and automatically switches to the FAX mode.

SW-G1 No. 5 ~ No. 8 Quiet detect start timing

Inserts a pause before commencing quiet detection.

SW-G2 No. 1 ~ No. 8 Off hook hold

Used to set Off hook hold time by binary input.
(0 to 255 seconds)

SW-G3 No. 1, No. 2 OGM detect timer

This is used to change the OGM detection time for answering machine hook up detection.

SW-G3 No. 3, No. 4 Reserved

Set to "0".

SW-G3 No. 5, No. 6 Section time of quiet detection

The switch which sets the time from the start of detection function to the end of the function.

SW-G3 No. 7, No. 8 Reserved

Set to "0".

SW-H1 No. 1 ~ No. 3 Reserved

Set to "0".

SW-H1 No. 4 Busy tone continuous sound detect time

Set detecting time busy tone continuous sound for 5 seconds or as is PTT.

SW-H1 No. 5 Reserved

Set to "0".

SW-H1 No. 6 Busy tone detect continuation sound detect (during ICM: for internal A.M.)

Used to select detection of the continuous sound of certain frequency.

SW-H1 No. 7 Reserved

Set to "0".

SW-H1 No. 8 Busy tone detect intermittent sound detect (during ICM: for internal A.M.)

Used to select detection of the intermittent sound of certain frequency.

SW-H2 No. 1, No. 2 Busy tone detection pulse number

Used to set detection of Busy tone intermittent sounds.

SW-H2 No. 3 Fax switching when A.M. full

If the answering machine's memory (tape) is full and there is no response, the machine automatically switches to Fax reception.

SW-H2 No. 4 ~ No. 8 Reserved

Set to "0".

SW-I1 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I2 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I3 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I4 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I5 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I6 No. 1 ~ No. 8 Reserved

Set to "0".

SW-I7 No. 1 ~ No. 8 Reserved

Set to "0".

SW-J1 No. 1 Activity report print

This soft switch is used to select: whether or not to print out the activity report when the memory is full. An activity report can be printed when the following key entry command is made.

"FUNCTION", "2", "#", "START"

After producing the activity report, all the data in the memory will be cleared.

When the switch function is set to "0" (no), the data in the memory will be deleted from the oldest as it reaches the maximum memory capacity.

SW-J1 No. 2 Total communication hours and pages print

Used to make a choice of whether the total communication time and pages are recorded in the activity report.

SW-J1 No. 3 Sender's phone number setting

Used to make a choice of whether the registered sender's phone number can be changed or not. If the switch is set to "1", new registration of the sender's phone number is disabled to prevent accidental wrong input.

SW-J1 No. 4, No. 5 Reserved

Set to "0".

SW-J1 No. 6 Summer time setting

Used to set YES/NO of automatic clock adjustment for European summer time.

SW-J1 No. 7, No. 8 Ringer volume

Used to adjust ringing volume.

SW-J2 No. 1, No. 2 Speaker volume (3 stages)

Used to adjust sound volume from a speaker.

SW-J2 No. 3 Polling key

If this switch is set to 1, the last of Rapid key works as polling key.

SW-J2 No. 4 ~ No. 8 Reserved

Set to "0".

SW-J3 No. 1 Automatic cover sheet

The machine automatically generates a cover sheet and sends it as the last page of each transmission.

SW-J3 No. 2 ~ No. 4 Communication result printout (Transaction report)

Every communication, the result can be output. As usual, it is set to print the timer sending communication error alone. If No. 2: 0 No. 3: 1 No. 4: 0 are set, printing is always on (printed even if it is normally ended).

000: Error, timer and memory sending/receiving

001: Sending

010: Continuous printing

011: Not printed

100: Communication error

SW-J3 No. 5 ~ No. 8 Reserved

Set to "0".

SW-K1 No. 1 Entering DIAG mode by pressing SPEED key

A bit which is used in the production process only. When the SPEED key is pressed, the switch is changed from the stand-by state to the DIAG mode.

SW-K1 No. 2 ~ No. 8 Reserved

Set to "0".

SW-L1 No. 1 ~ No. 4 Reserved

Set to "0".

SW-L1 No. 5 Cut off mode (COPY mode)

Whether the excessive part is printed on the next recording paper or discarded is selected to copy a document which is longer than the recording paper.

UX-310DE
FO-730DE/NX-530DE

SW-L1 No. 6 A4 Paper enable

The use of recording paper of A4 is enabled.

SW-L1 No. 7 LEGAL and LETTER paper enable

The use of recording paper of LEGAL and LETTER is enabled.

SW-L1 No. 8 Reserved

Set to "0".

SW-L2 No. 1, No. 2 Paper set size

At present size of the recording paper.

SW-L2 No. 3 Automatic reduce of receive

If set to 1, it is reduced automatically when receiving.

SW-L2 No. 4 Print contrast

0: Normal.

1: Light

SW-L2 No. 5 Reception reduction ratio in case of memory full

This model is designed so that the print is started according to the setting of SW-L2 No.3 when reception of one page is completed. However, if the memory is filled with data before completion of reception of one page, the print is started with the reduction ratio which is set with this switch.

SW-L2 No. 6 ~ No. 8 Reserved

Set to "0".

SW-M1 No. 1 ~ No. 8 Reserved

Set to "0".

SW-M2 No. 1 ~ No. 8 Reserved

Set to "0".

[3] Troubleshooting

Refer to the following actions to troubleshoot any of problems mentioned in 1-4.

[1] A communication error occurs.

[2] Image distortion produced.

[3] Unable to do overseas communication.

[4] Communication speed slow due to FALLBACK.

- Increase the transmission level SOFT SWITCH A4-1, 2, 3, 4, 5.
May be used in case [1] [2] [3].
- Decrease the transmission level SOFT SWITCH A4-1, 2, 3, 4, 5. May be used in case [3].

- Apply line equalization SOFT SWITCH A5-1, 2.
May be used in case [1] [2] [3] [4].

- Slow down the transmission speed SOFT SWITCH A2-1, 2, 3, 4. May be used in case [2] [3].

- Replace the TEL/LIU PWB.
May be used in all cases.

- Replace the control PWB.
May be used in all cases.

* If transmission problems still exist on the machine, use the following format and check the related matters.

TO: _____ ATT: _____ Ref.No.: _____
CC: _____ ATT: _____ Date: _____
FM: _____ Dept: _____
Sign: _____

***** Facsimile communication problem *****				Ref.No.:																						
From: Mr.		Fax Tel No.:		Date:																						
Our customer	Name			Tel No.																						
	Address			Fax No.																						
	Contact person			Model name																						
Other party	Name			Tel No.																						
	Address			Fax No.																						
	Contact person			Model name																						
Problem mode	Line: Domestic / international		Model: G3	Phase: A, B, C, D.																						
	Reception / Transmission		Automatic reception / Manual reception																							
			Automatic dialing / Manual dialing / Others																							
Frequency:		%	ROM version:																							
Confirmation item				Please mark problem with an X.																						
				No problem is: 0.																						
				<table border="1"> <tr> <th>A1</th> <th>A2</th> <th>B1</th> <th>B2</th> <th>C1</th> <th>C2</th> <th>D1</th> <th>D2</th> <th>E1</th> <th>E2</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>			A1	A2	B1	B2	C1	C2	D1	D2	E1	E2										
				A1	A2	B1	B2	C1	C2	D1	D2	E1	E2													
Transmission level setting is () dB at our customer																										
Comment				Transmission level () dBm																						
				Reception level () dBm																						
				By level meter at B1 and B2																						
Countermeasure																										

**** Please attach the G3 data and activity report on problem. ****

* Please complete this report before calling the "TAC" hotline if problem still occurs.

[4] Error code table

1. Communication error code table

G3 Transmission

Code	Final received signal	Error Condition (Receiver side)
0	Incomplete signal frame	Cannot recognize bit stream after flag
1	NSF, DIS	Cannot recognize DCS signal by echo etc. Cannot recognize NSS signal (FIF code etc)
2	CFR	Disconnects line during reception (carrier missing etc)
3	FTT	Disconnects line by fall back
4	MCF	Disconnects line during reception of multi page Cannot recognize NSS, DCS signal in the case of mode change
5	PIP or PIN	The line is hung up without replying to telephone request from the receiving party.
6	RTN or RTP	Cannot recognize NSS, DCS signal after transmit RTN or RTP signal.
7	No signal or DCN	No response in receiver side or DCN signal received* (transmitter side)
8	—	Owing to error in some page the error could not be corrected although the specified number of error retransmission was attempted.
11	—	Error occurred after or while reception by the remote (receiving) machine was revealed to be impossible.
12	—	Error occurred just after fallback.
13	—	Error occurred after a response to retransmission end command was received.

G3 Reception

Code	Final received signal	Error Condition (Receiver side)
0	Incomplete signal frame	Cannot recognize bit stream after flag
1	NSS, DCS	Cannot recognize CFR or FTT signal Disconnects line during transmission (line error)
2	NSC, DTC	Cannot recognize NSS signal (FIF code etc)
3	EOP	Cannot recognize MCF, PIP, PIN, RTN, RTP signal
4	EOM	Cannot recognize MCF, PIP, PIN, RTN, RTP signal in the case of mode change
5	MPS	The line is hung up without replying to communication request.
6	PR1-Q	Cannot recognize PIP, PIN signal in the case of TALK request
7	No signal or DCN	No response in transmitter (cannot recognize DIS signal) or DCN signal received* (receiver side)
8	—	Error occurred upon completion of reception of all pages.
9	—	Error occurred when mode was changed or Transmission/Reception switching was performed.
10	—	Error occurred during partial page or physical page reception.
11	—	Error occurred after or during inquiry from the remote (transmitting) machine as to whether reception is possible or not.
12	—	Error occurred during or just after fallback.
13	—	Error occurred after the retransmission end command was received.

CHAPTER 3. MECHANISM BLOCKS

[1] General description

1. Document feed block and diagram

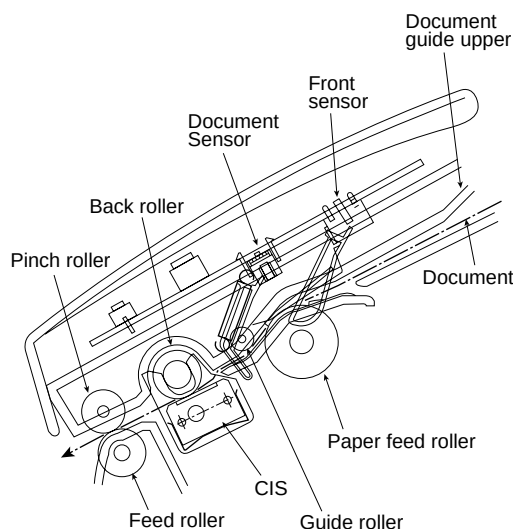


Fig. 1

2. Document feed operation

- 1) The original, which is set in the document hopper, feeds automatically when the front sensor is activated. This in turn activates the pulse motor which drives the document supply roller. The document stops when the lead edge is detected by the document sensor.
- 2) The lead edge of the original is fed a specified number of pulses after the lead edge of the document is detected for the reading process to begin.
- 3) The trailing edge of the original is fed a specific number of pulses after the trailing edge of the document deactivates the document sensor. The read process then stops and the original is discharged.
- 4) When the front sensor is in the OFF state (any document is not set up in the hopper guide), the drive will be stopped when the document is discharged.

3. Hopper mechanism

3-1. General view

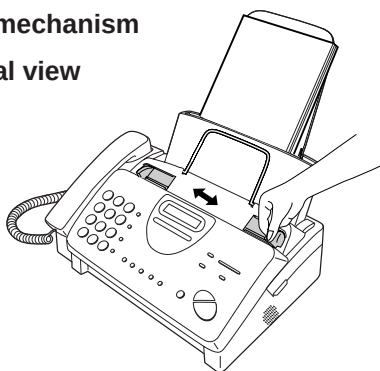


Fig. 2

The hopper section contains document guides that are used to adjust the hopper to the width of the original document. This ensures that the original feeds straight into the fax machine for scanning.
Document width: 148 mm to 216 mm (A5 longitudinal size to Letter longitudinal size)

NOTE: Adjust the document guide after setting up the document.

3-2. Automatic document feed

- 1) Use of the paper feed roller and separation rubber plate ensures error-free transport and separation of documents. The plate spring presses the document to the paper feed roller to assure smooth feeding of the document.
- 2) Document separation method: Separation rubber plate

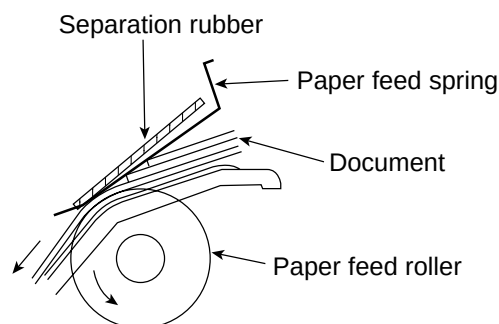


Fig. 3

3-3. Documents applicable for automatic feed

	4x6 series (788mm x 1091mm x 1000mm sheets)		Square meter series	
	Minimum	Maximum	Minimum	Maximum
Feeder capacity	10 sheets, max.			
Paper weight	45kg	64.3kg	52g/m ²	74.3g/m ²
Paper thickness (ref.)	0.06mm	0.09mm	0.06mm	0.09mm
Paper size	B6 (128mm x 182mm) ~ A4 (210mm x 297mm), Letter (216mm x 279mm)			

NOTE: Double-side coated documents and documents on facsimile recording paper should be inserted manually. The document feed quantity may be changed according to the document thickness.

Documents corresponding to a paper weight heavier than 64.3kg (74.3g/m²) and lighter than 135kg (157g/m²) are acceptable for manual feed.

Documents heavier than 135kg in terms of the paper weight must be duplicated on a copier to make it operative in the facsimile.

3-4. Loading the documents

- 1) Make sure that the documents are of suitable size and thickness, and free from creases, folds, curls, wet glue, wet ink, clips, staples and pins.
- 2) Place documents face down in the hopper.
 - i) Adjust the document guides to the document size.
 - ii) Align the top edge of documents and gently place them into the hopper. The first page under the stack will be taken up by the feed roller to get ready for transmission.

NOTES: 1) Curled edge of documents, if any, must be straighten out.

2) Do not load the documents of different sizes and/or thicknesses together.

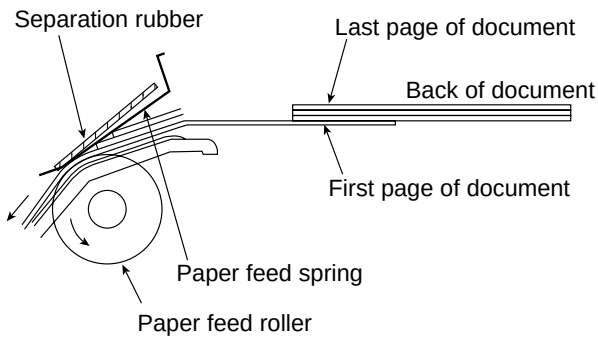


Fig. 4

3-5. Documents requiring use of document carrier

- 1) Documents smaller than B6 (128mm x 182mm).
- 2) Documents thinner than the thickness of 0.06mm.
- 3) Documents containing creases, folds, or curls, especially those whose surface is curled (maximum allowable curl is 5mm).
- 4) Documents containing tears.
- 5) Carbon-backed documents. (Insert a white sheet of paper between the carbon back and the document carrier to avoid transfer of carbon to the carrier.)
- 6) Documents containing an easily separable writing material (e.g., those written with a lead pencil).
- 7) Transparent documents.
- 8) Folded or glued documents.

Document in document carrier should be inserted manually into the feeder.

4. Document release

4-1. General

To correct a jammed document or to clean the document running surface, pull the insertion side of document center of the operation panel. To open the upper document guide, the operation panel must be opened first.

4-2. Cross section view

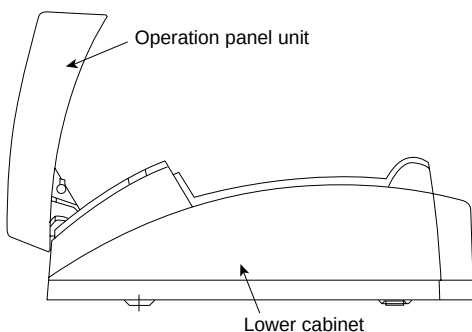


Fig. 5

5. Recording block

(1) General view

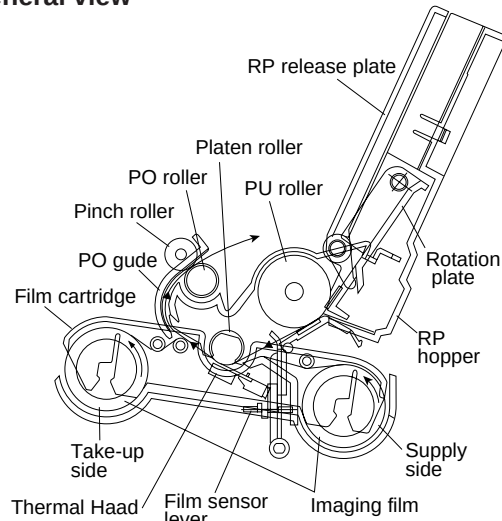


Fig. 6

5-1. Driving

In the drive mechanism, the rotating force of the pulse motor for both transmission and reception is transmitted to the paper supply roller, the recording paper feed roller and imaging film drive gear through the pulse motor axle gear, reduction gear and planetary gear.

5-2. Recording

This equipment employs the thermal transcription system which used the thermal head imaging film.

1) Thermal head

The thermal head is composed of 2,016 heating elements in traverse line, and the resolution power is 8 dots/mm. The maximum speed is 10 ms/line.

2) Structure of recording mechanism

Recording is achieved by applying a suitable pressure to the thermal head through the imaging film of the recording paper feed roller and the recording paper.

The main scanning is electronically done, and the sub-scanning is mechanically done (by sending the recording paper with the recording paper feed roller).

3) Recording paper transfer sequence

- a) The recording paper stored in the RP hopper is fed with the PU roller, and the recording paper is stopped when the P-IN sensor is turned on by sensing its lead edge.
- b) Hereafter, the imaging film and recording paper are transferred with the recording paper feed roller, and thermal transcription is done on the recording paper.
- c) After thermal transcription, the imaging film is taken up by the roller on the take-up side, and the recording paper is discharged by the PO roller.

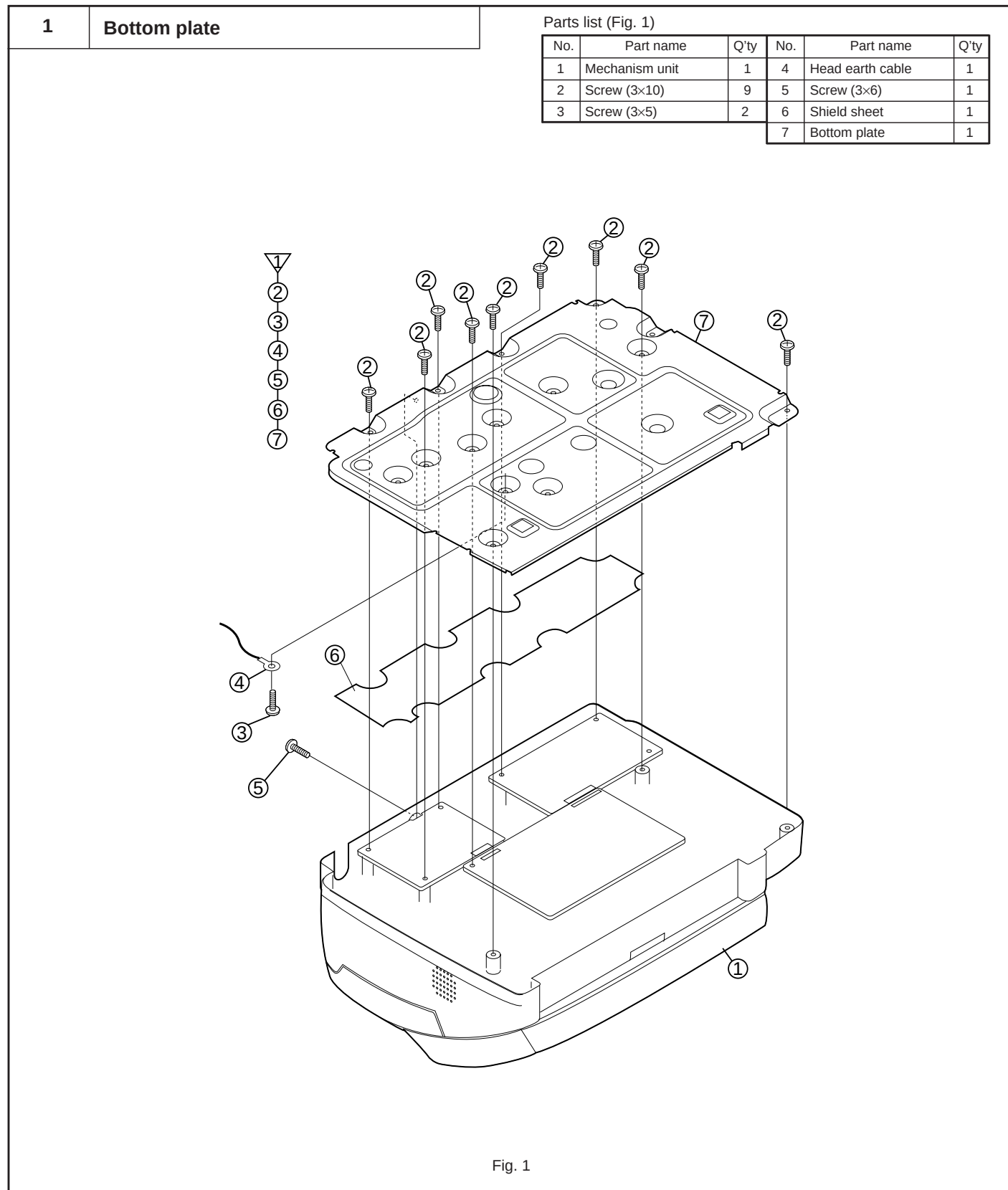
As basic, the density unevenness mainly results from the longitudinal misalignment of the thermal head to the heater line. Otherwise, the head is in uneven contact with the recording paper feed roller, or the imaging film is wrinkled.

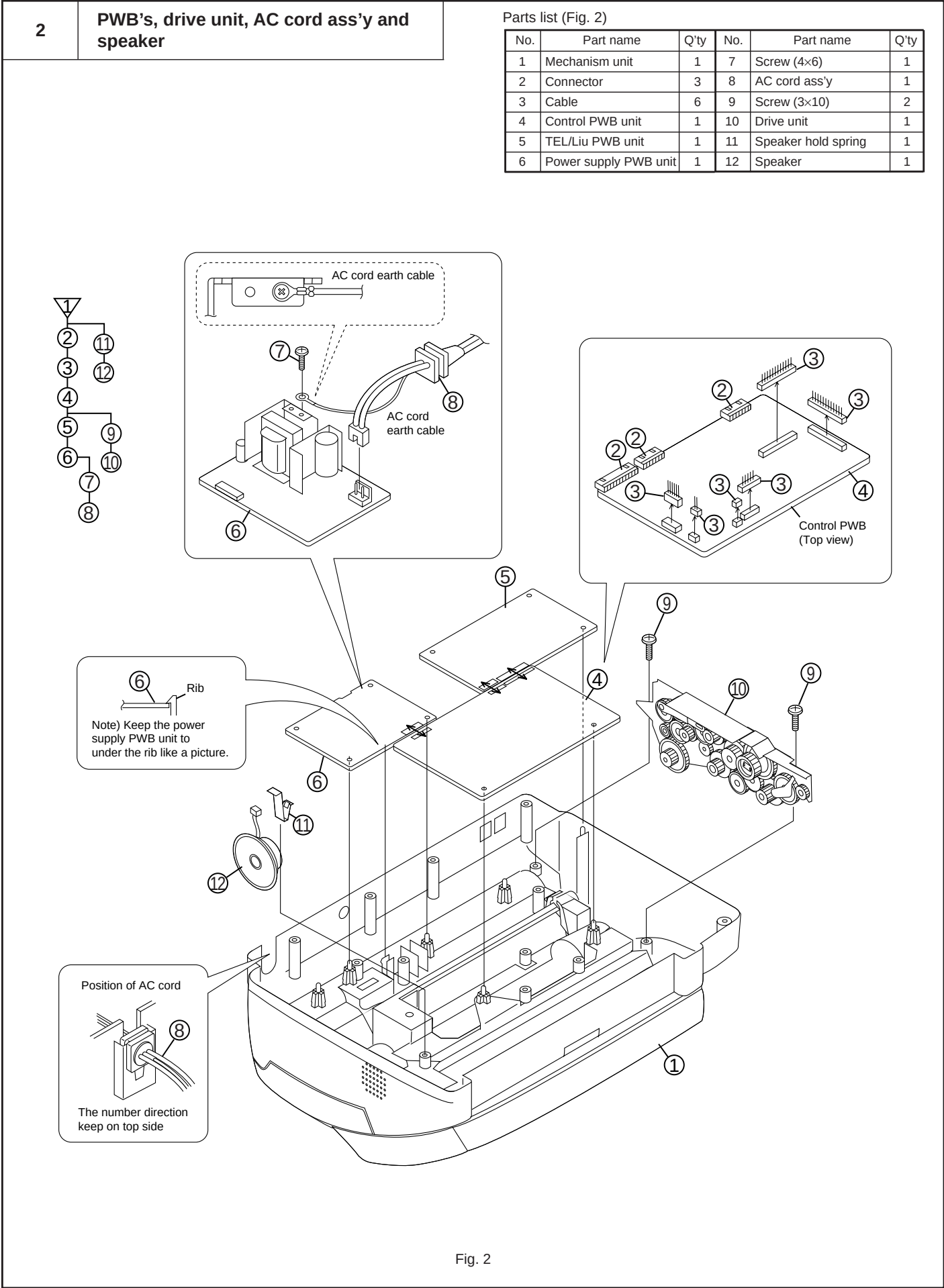
The following items are described as the simplified checking method.

- ① Are the power and signal cables of the thermal head suitably treated?
- ② Does the same symptom appear even if the thermal head pressure spring is replaced?
- ③ Is the feed roller of the recording paper concentric? (Density is uneven at intervals.)
- ④ Does the same symptom appear even if the thermal head is replaced?
- ⑤ Is the imaging film stained or wrinkled?

[2] Disassembly and assembly procedures

- This chapter mainly describes the disassembly procedures. For the assembly procedures, reverse the disassembly procedures.
- Easy and simple disassembly/assembly procedures of some parts and units are omitted. For disassembly and assembly of such parts and units, refer to the Parts List.
- The numbers in the illustration, the parts list and the flowchart in a same section are common to each other.
- To assure reliability of the product, the disassembly and the assembly procedures should be performed carefully and deliberately.





3

Paper roller etc. and sensor lever

Parts list (Fig. 3)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	8	Platen lock bracket	1
2	Sheet A	1	9	Platen lock lever, left	1
3	P-IN sensor lever B	1	10	Platen lock lever, right	1
4	PE sensor lever B	1	11	Platen lock lever spring	1
5	PE sensor lever spring B	1	12	PO roller	1
6	Screw (3×10)	1	13	Transfer bearing	2
7	BT gear ass'y	1	14	Back roller gear	1

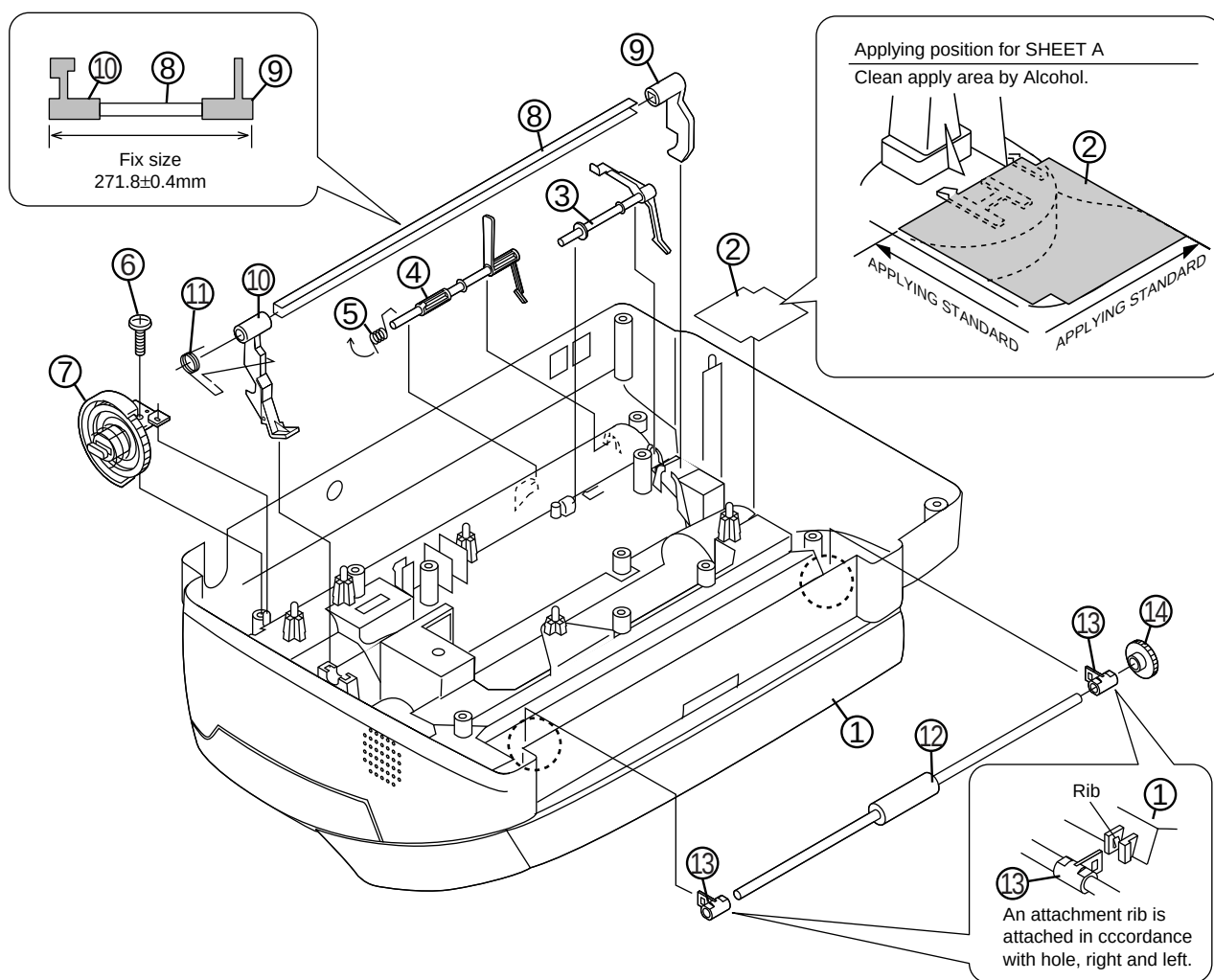
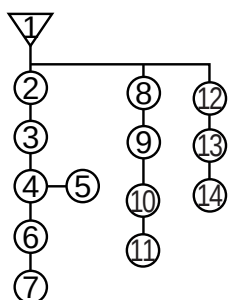


Fig. 3

4	Drive frame
---	-------------

Parts list (Fig. 4)

No.	Part name	Q'ty	No.	Part name	Q'ty	No.	Part name	Q'ty
1	Screw (3×10)	2	9	Idler gear, 52Z	1	17	Reduction gear, 4	1
2	Motor	1	10	Reduction gear, 3	1	18	Planet gear lever C ass'y	1
3	Motor plate	1	11	Reduction gear, 2	1	19	Planet gear lever B ass'y	1
4	Take up gear	1	12	Reduction gear, 5	1	20	Reduction gear, 1	1
5	Slip gear ass'y	1	13	Reduction gear C	1	21	Cam hold spring	1
6	Reduction gear, 6	1	14	Link lever	1	22	Cam A	1
7	Planet gear lever D ass'y	1	15	Planet gear lever A ass'y	1	23	Cam B	1
8	Idler gear B	1	16	Idler gear, 30Z	3	24	Cam switch	1
						25	Drive frame	1

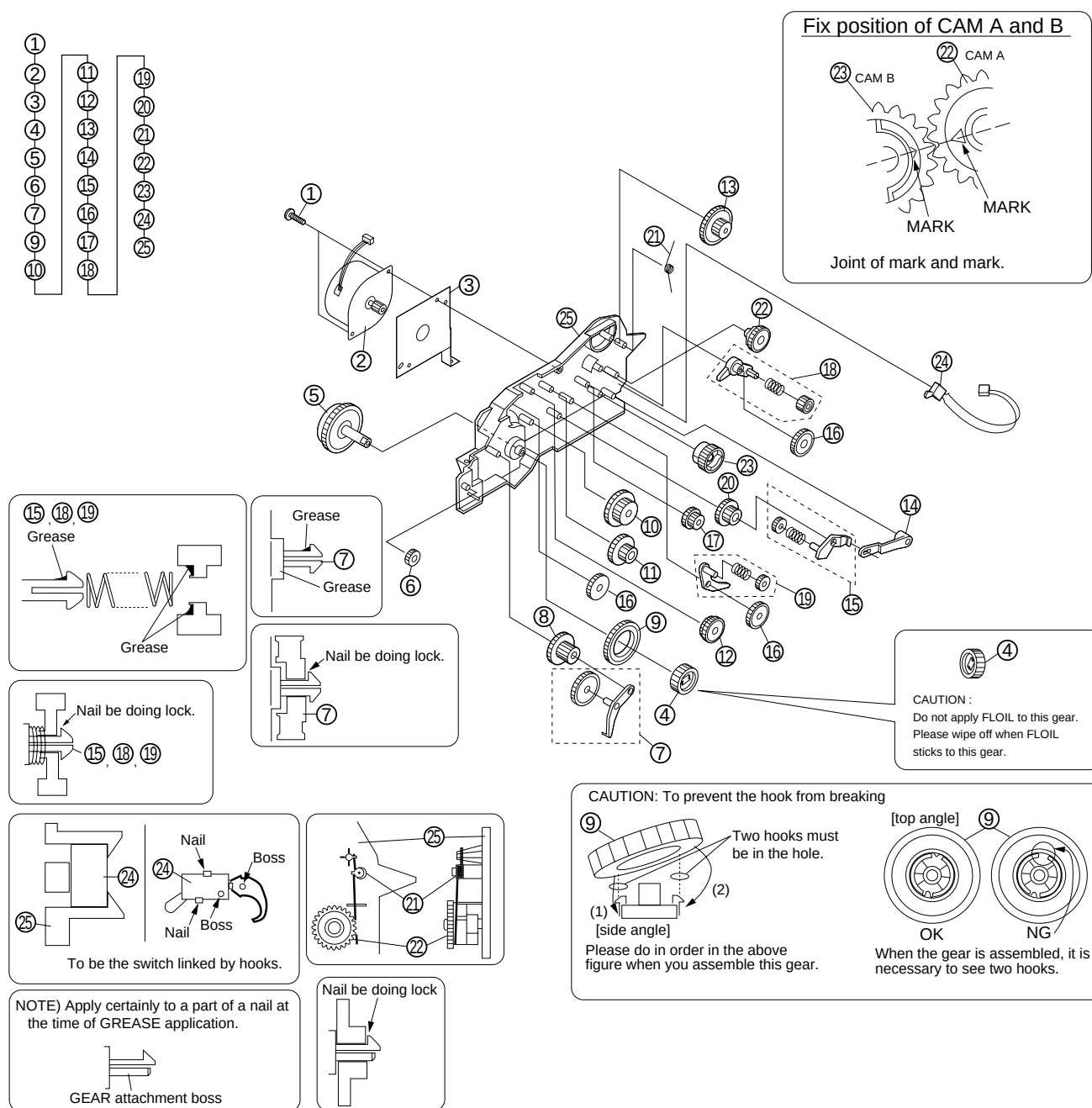


Fig. 4

5

Sub frame unit, original paper guide, operation panel unit and CIS unit

Parts list (Fig. 5)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	8	CIS unit	1
2	Hook switch lever	1	9	CIS spring	2
3	Sub frame unit	1	10	Cover switch spring	1
4	Screw (3×10)	2	11	Cover switch lever	1
5	Original paper guide unit	1	12	Feed roller shaft	1
6	Operation panel unit	1	13	Feed roller	1
7	Film guide shaft	1	14	Original paper guide	1

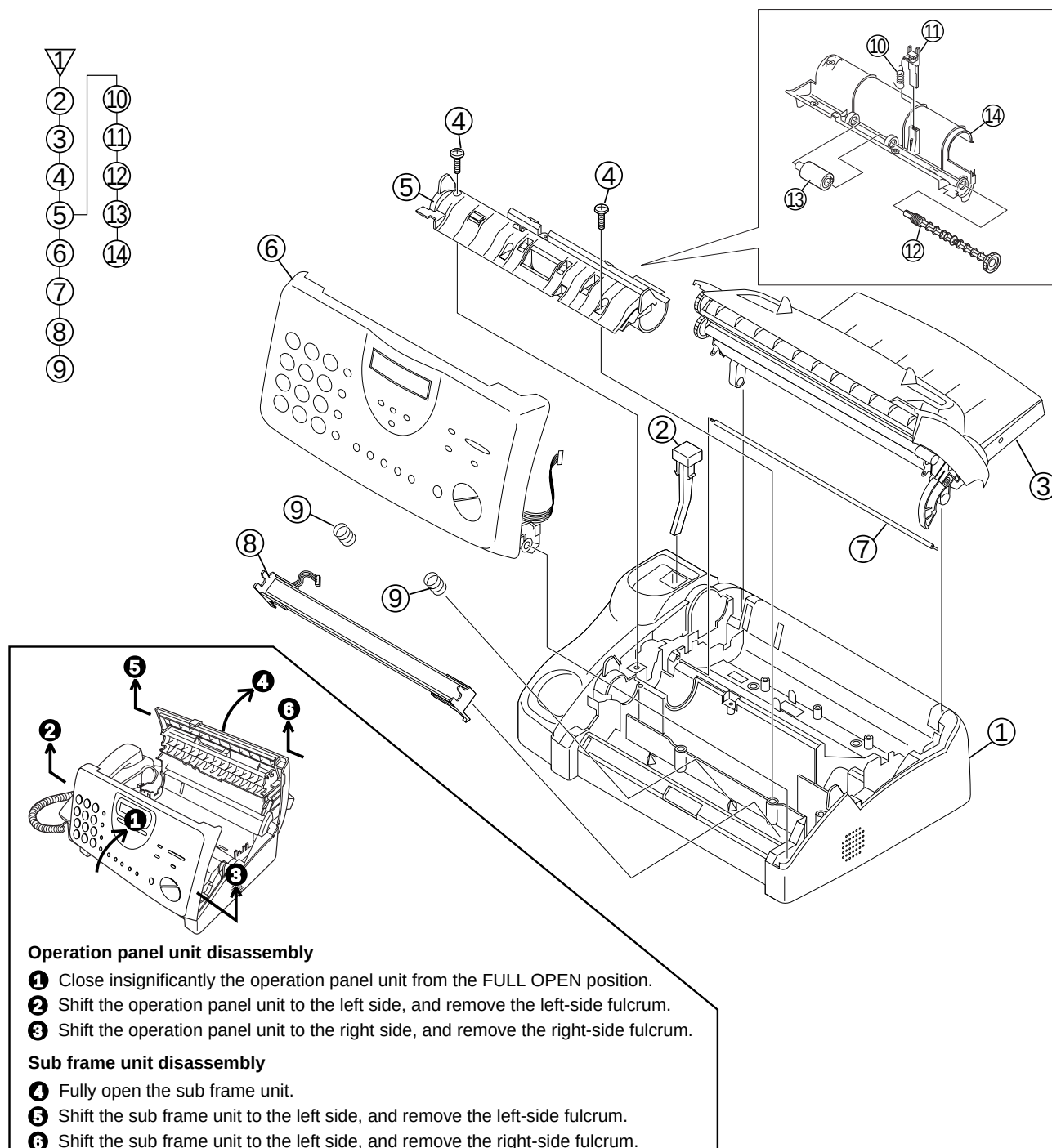


Fig. 5

6 Upper cabinet and document guide upper unit

Parts list (Fig. 6)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Screw (3×8)	2	6	Operation panel PWB	1
2	Document guide upper unit	1	7	Direct key	1
			8	Mode key	1
3	Operation panel unit	1	9	Stop key	1
4	Screw (2×6)	5	10	Start key	1
5	Cable	1	11	12 key	1
			12	Upper cabinet	1

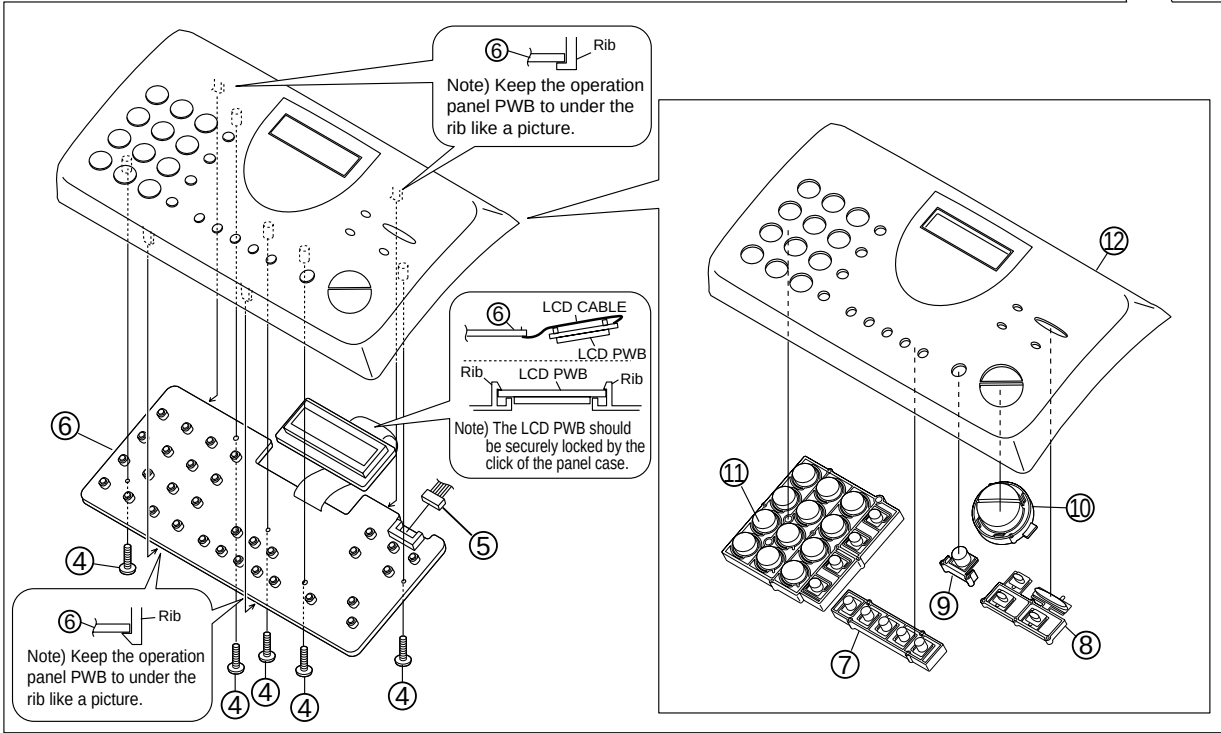
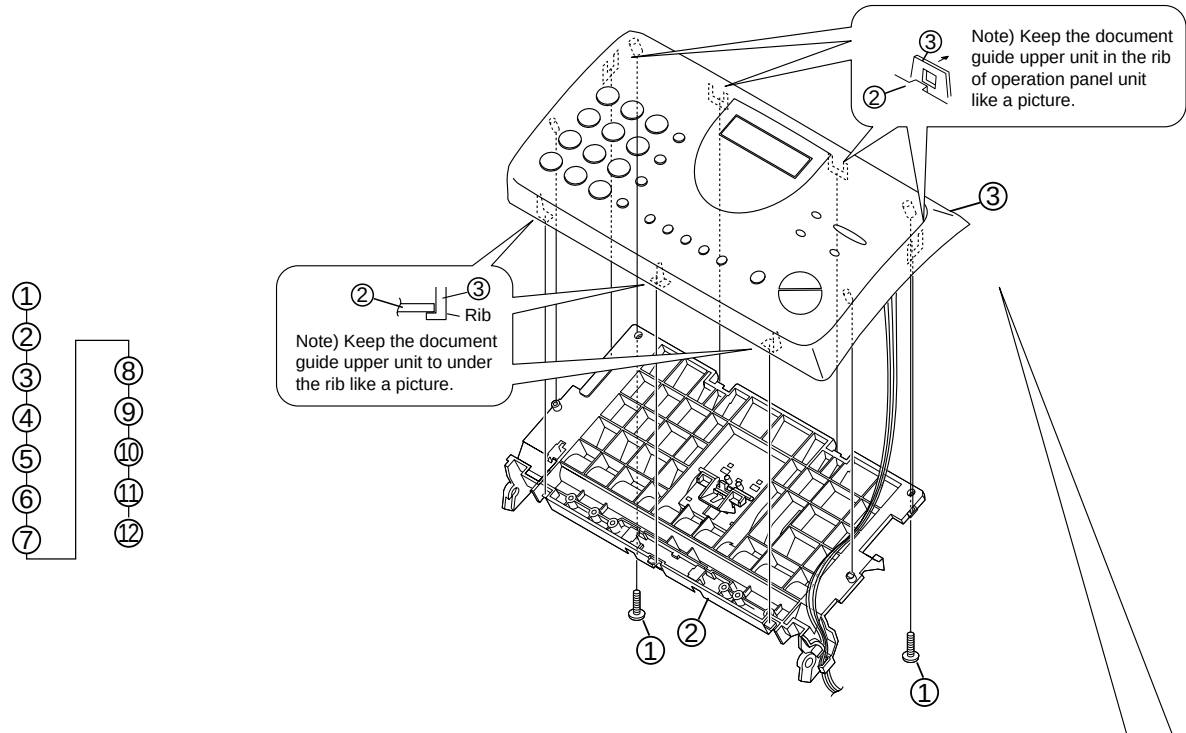


Fig. 6

7

Document guide upper

Parts list (Fig. 7)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Back roller gear	1	7	Separate spring	1
2	Transfer bearing	1	8	Separator plate	1
3	Back roller	1	9	Paper feed spring	1
4	Pinch roller spring	2	10	Separator rubber	1
5	Pinch roller	2	11	Guide roller	1
6	Pinch roller shaft	1	12	Document guide upper	1

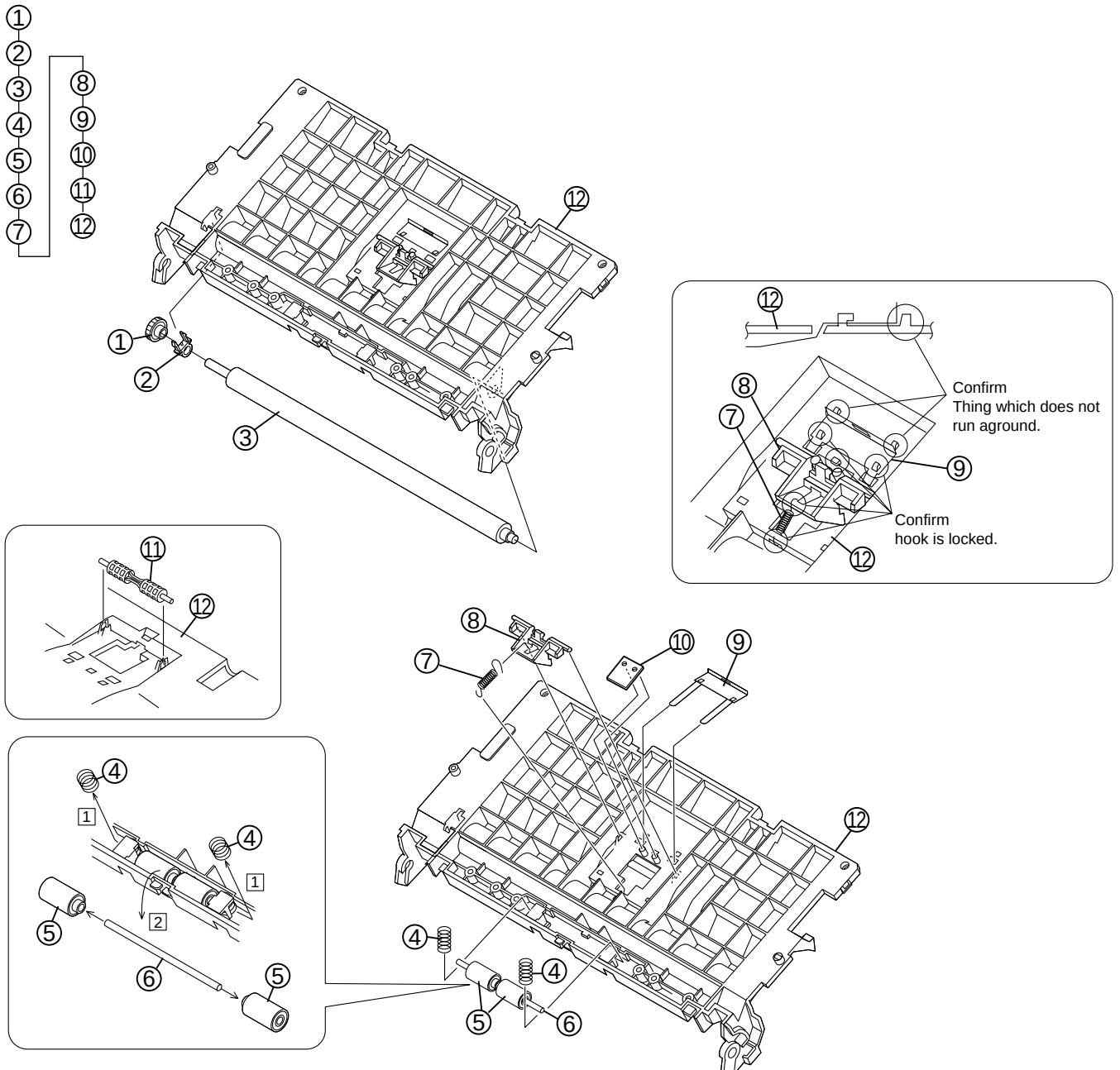


Fig. 7

Sub frame, top cover unit RP hopper unit

Parts list (Fig. 8)

No.	Part name	Q'ty	No.	Part name	Q'ty	No.	Part name	Q'ty
1	Top cover unit	1	10	PO pinch roller spring	2	19	Platen bearing, right	1
2	Screw (3x10)	2	11	PO pinch roller	2	20	Platen roller	1
3	Sub frame unit	1	12	PO guide	1	21	PU shaft	1
4	RP hopper unit	1	13	PE sensor lever	1	22	PU roller ass'y	1
5	Sub frame ass'y	1	14	PO gear	1	23	P-IN sensor lever spring	1
6	Screw (3x10)	1	15	PO roller ass'y	1	24	P-IN sensor lever	1
7	Tension gear	1	16	Film guide shaft	1	25	Sub frame	1
8	Tension spring	1	17	Platen gear	1	26	PO roller rubber	2
9	PO guide ass'y	1	18	Platen bearing, left	1	27	PO roller shaft	1

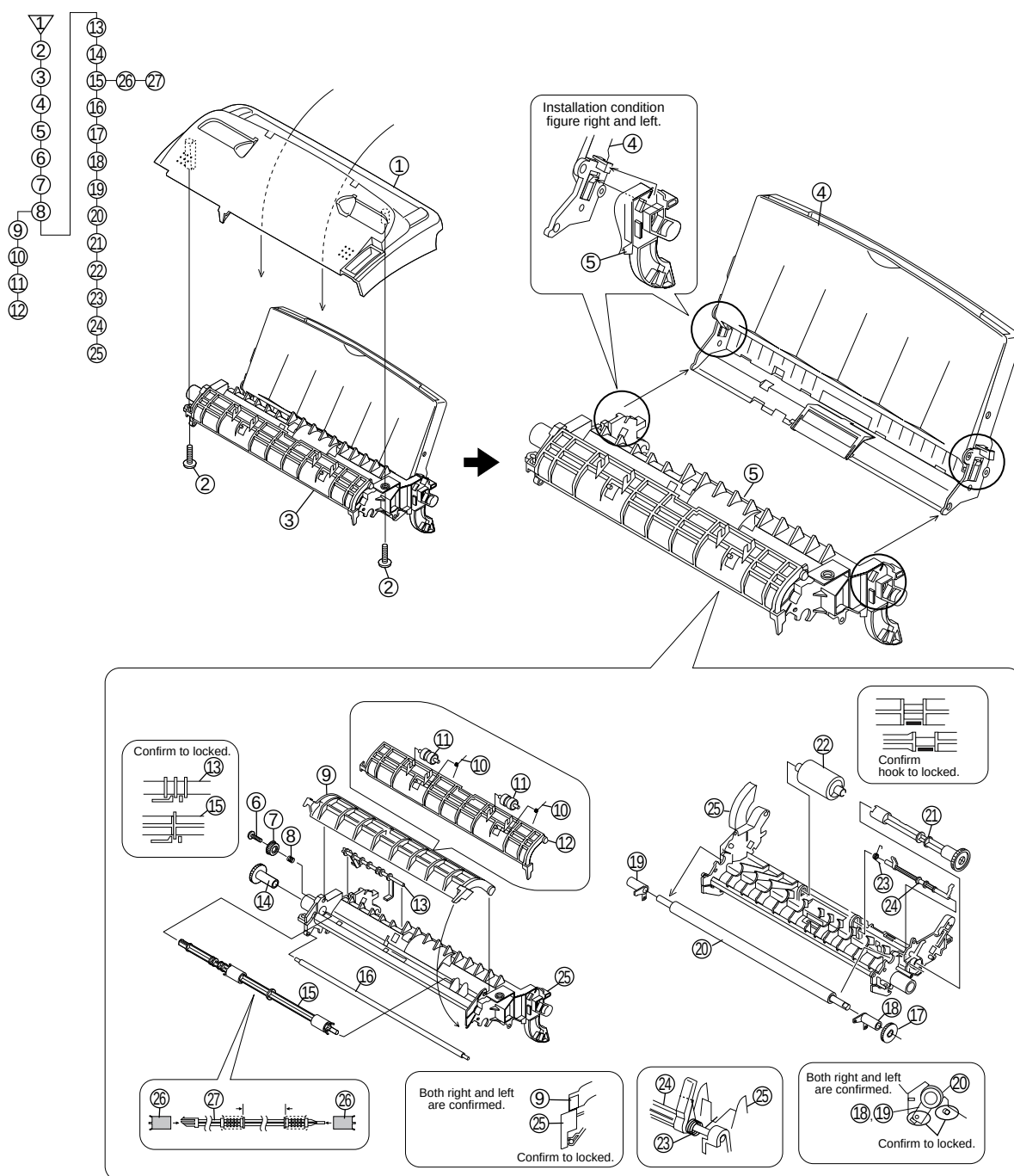


Fig. 8

9

Top cover and RP hopper

Parts list (Fig. 9)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Release knob	1	9	RP release plate	1
2	Screw	1	10	Rotation plate	1
3	Pinion gear	1	11	RP pad	1
4	Hopper spring	1	12	C-spring	1
5	Hopper guide, right	1	13	Separate plate	1
6	Hopper guide, left	1	14	Separate plate sheet	1
7	TC sheet	1	15	Separate spring	1
8	Top cover	1	16	A4 paper guide	1
			17	RP hopper	1

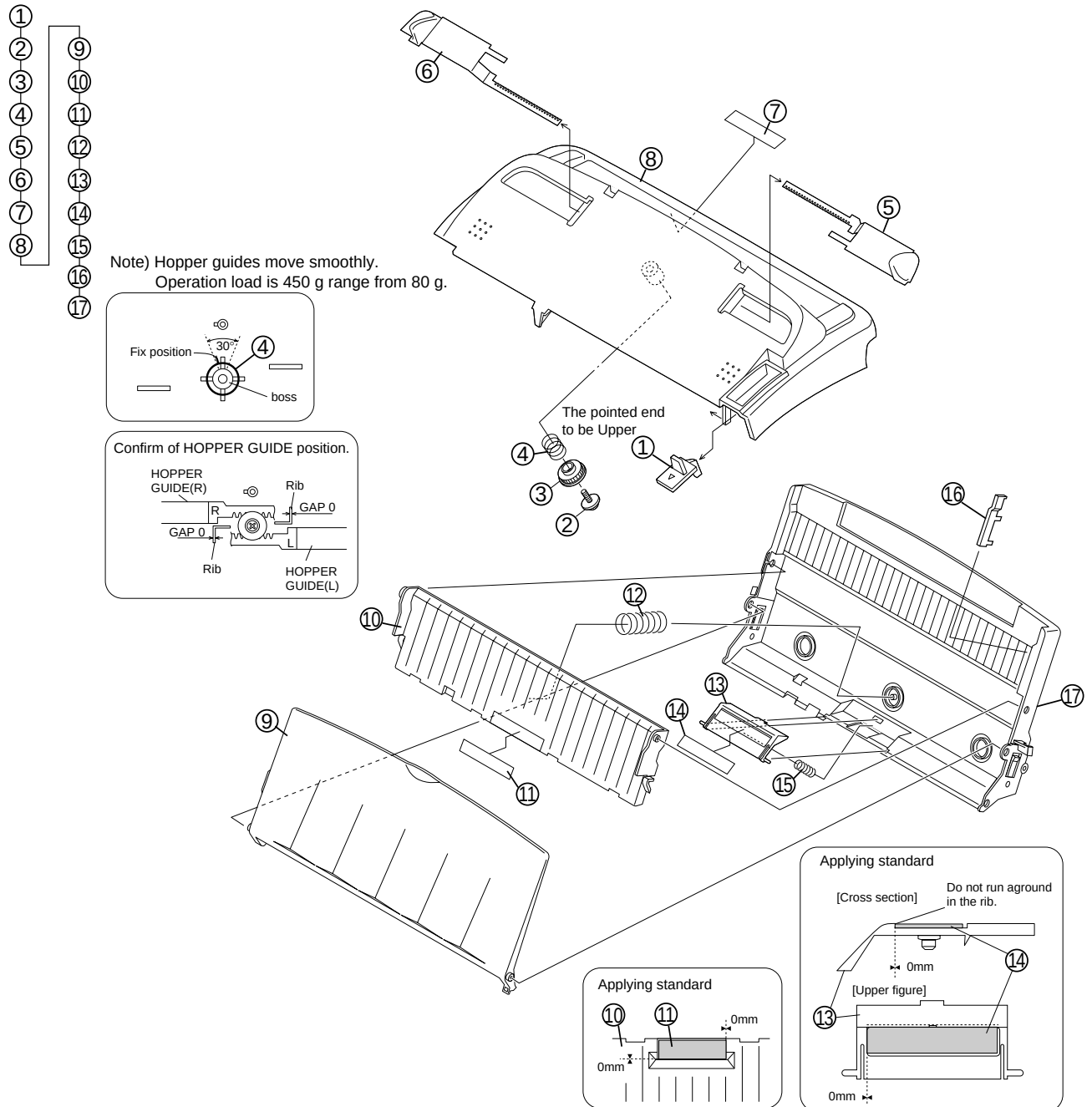


Fig. 9

10

Thermal head

1

2

3

4

5

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7

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16

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18

19

20

21

22

23

View A

8

7

Rib

Install the spring on the ditch of the rib.

The head and head earth cable pass to the core 2 times.

9

10

1

7

8

View A

4

3

2

6

20

19

18

22

21

23

11

12

13

14

15

16

17

16

11

12

13

14

15

16

17

4

5

6

Tightening torque
6.0±0.5kg.cm

Put the earth cable in parallel to the head frame.

Parts list (Fig. 10)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	12	Thermal head ass'y	1
2	Screw (3×10)	1	13	Head spring E	2
3	Head cover	1	14	Head spring B	2
4	Screw (3×10)	2	15	Head spring F	1
5	Head earth cable	1	16	Head cushion	2
6	Head unit	1	17	Head frame	1
7	Film sensor lever spring	1	18	Head cable	1
8	Film sensor lever	1	19	Screw (3×6)	1
9	Screw (3×10)	2	20	Head guide, right	1
10	Panel lock lever spring	2	21	Screw (3×6)	1
11	Head spring D	2	22	Head guide, left	1
			23	Thermal head	1

Fig. 10

3 – 12

11

Wire treatment

Parts list (Fig. 11)

No.	Part name	Q'ty
1	Screw (3×10)	1
2	Screw (4×6)	1
3	Core (F2064)	2
4	Core (F2063)	1
5	Screw (3×5)	1
6	Band	1

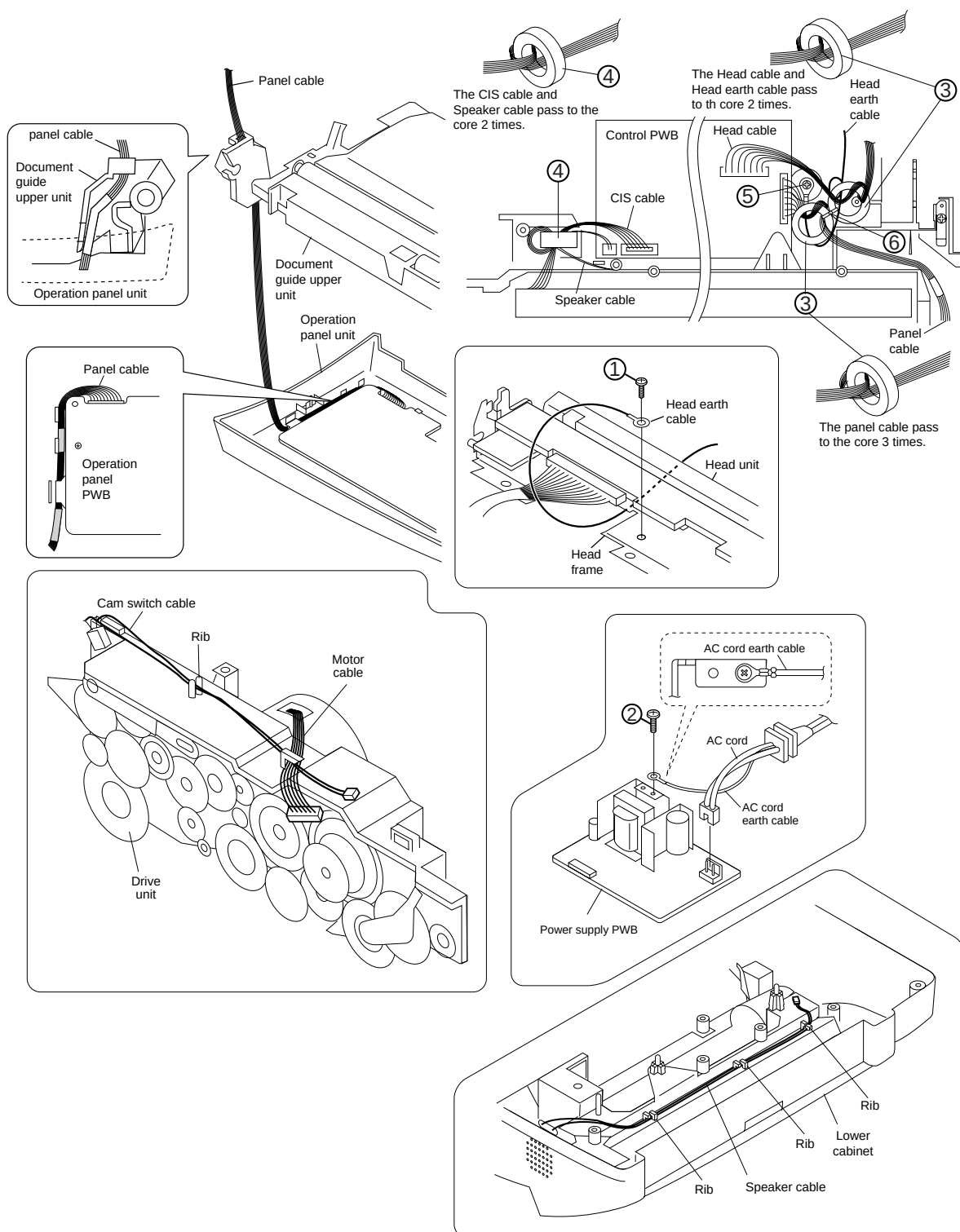
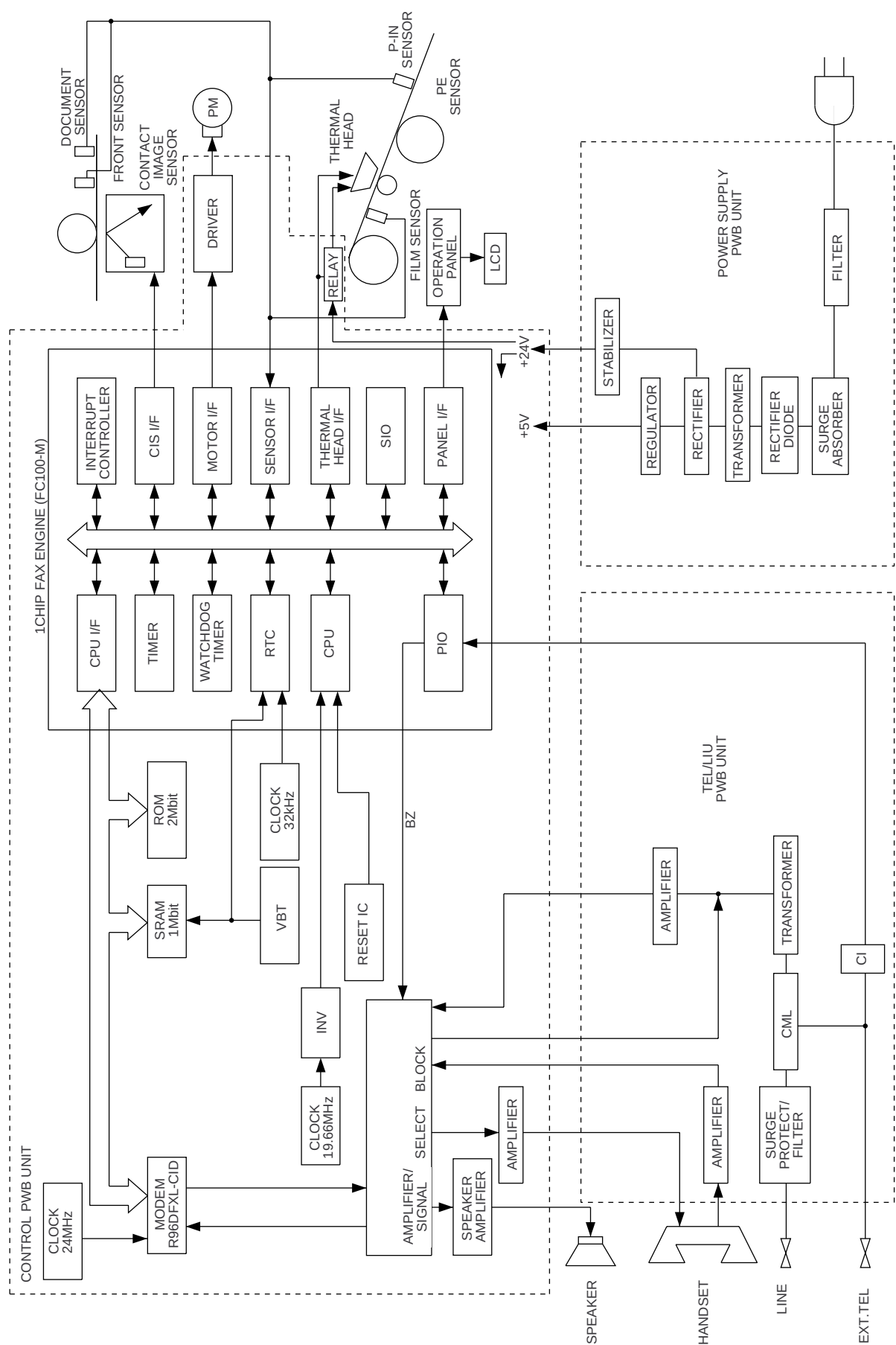


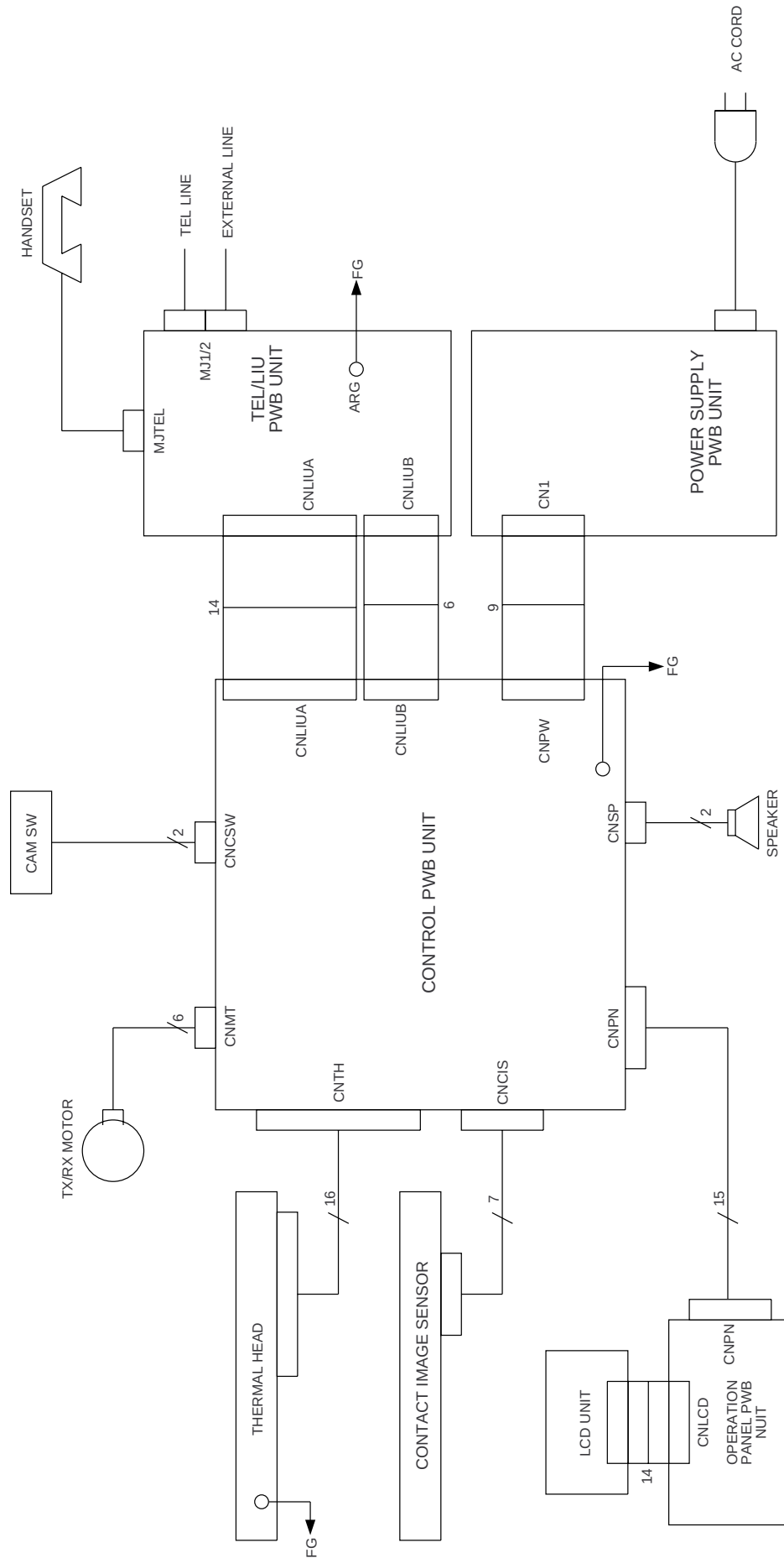
Fig. 11

CHAPTER 4. DIAGRAMS

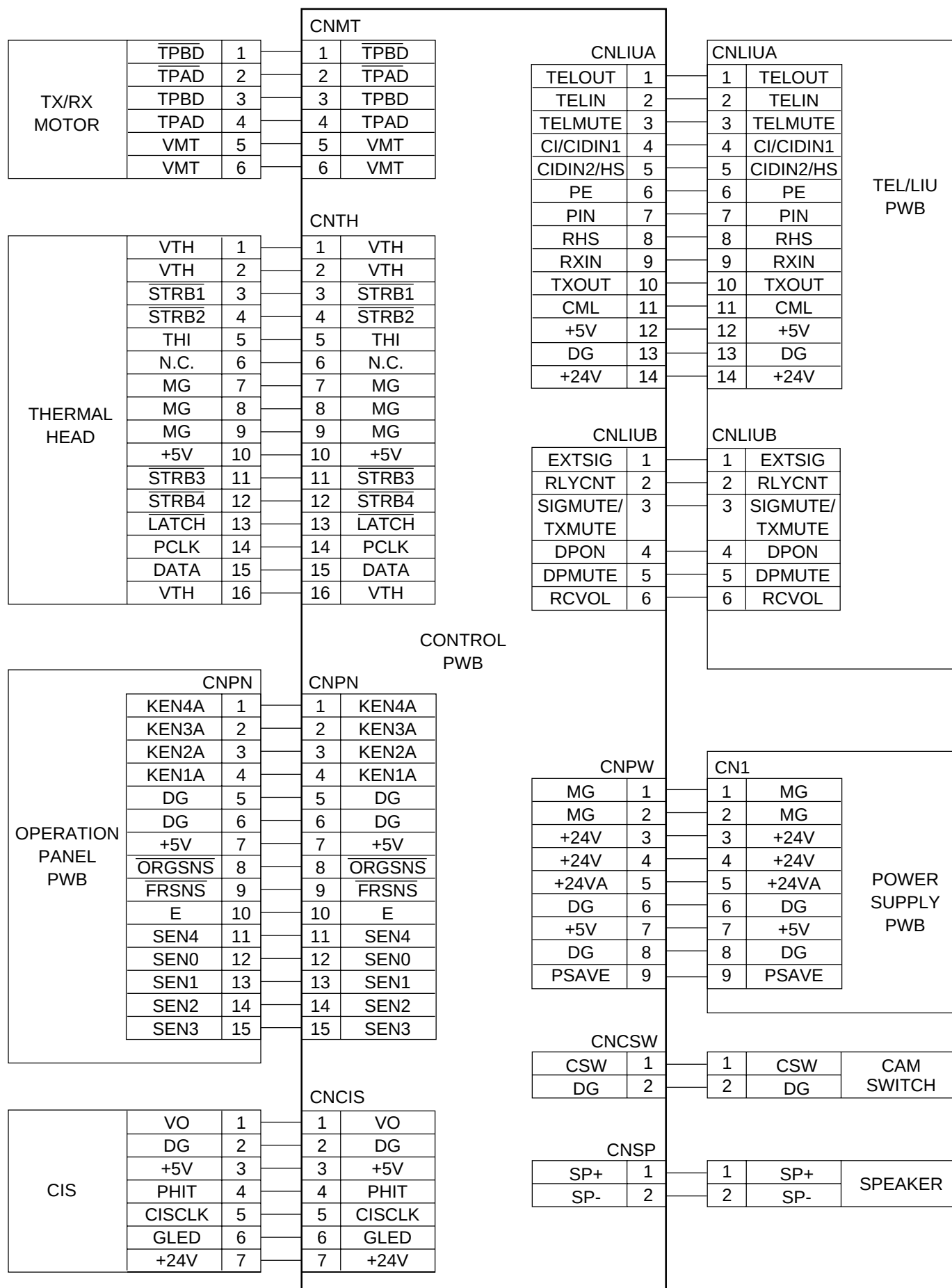
[1] Block diagram



[2] Wiring diagram



[3] Point- to-point diagram



CHAPTER 5. CIRCUIT DESCRIPTION

[1] Circuit description

1. General description

The compact design of the control PWB is obtained by using ROCKWELL fax engine in the main control section and high density printing of surface mounting parts. Each PWB is independent according to its function as shown in Fig. 1.

2. PWB configuration

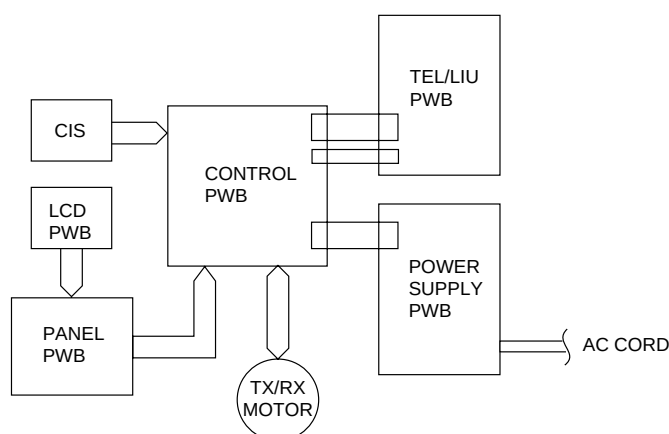


Fig. 1

1) Control PWB

The control PWB controls peripheral PWBs, mechanical parts, transmission, and performs overall control of the unit.

This machine employs a 1-chip modem (R96DFXL-CID) which is installed on the control PWB.

2) TEL/LIU PWB

This PWB controls connection of the telephone line to the unit.

3) Power supply PWB

This PWB provides voltages of +5V and +24V to the other PWBs.

4) Panel PWB

The panel PWB allows input of the operation keys.

5) LCD PWB

This PWB controls the LCD display.

3. Operational description

Operational descriptions are given below:

- Transmission operation

When a document is loaded in standby mode, the state of the document sensor is sensed via the 1 chip fax engine (FC100M). If the sensor signal was on, the motor is started to bring the document into the standby position. With depression of the START key in the off-hook state, transmission takes place.

Then, the procedure is sent out from the modem and the motor is rotated to move the document down to the scan line. In the scan processor, the signal scanned by the CIS is sent to the internal image processor and the AD converter to convert the analog signal into binary data. This binary data is transferred from the scan processor to the image buffer within the RAM and encoded and stored in the transmit buffer of the RAM. The data is then converted from parallel to serial form by the modem where the serial data is modulated and sent onto the line.

- Receive operation

There are two ways of starting reception, manual and automatic. Depression of the START key in the off-hook mode in the case of manual receive mode, or CI signal detection by the LIU in the automatic receive mode.

First, the FC100M controls the procedure signals from the modem to be ready to receive data. When the program goes into phase C, the serial data from the modem is converted to parallel form in the modem interface of the 1 chip fax engine (FC100M) which is stored in the receive buffer of the RAM. The data in the receive buffer is decoded software-wise to reproduce it as binary image data in the image buffer. The data is DMA transferred to the recording processor within the FC100M which is then converted from parallel to serial form to be sent to the thermal head. The data is printed line by line by the FC100M which is assigned to control the motor rotation and strobe signal.

- Copy operation

To make a copy on this facsimile, the COPY key is pressed when the machine is in stand-by with a document on the document table and the telephone set is in the on-hook state.

First, depression of the COPY key advances the document to the scan line. Similar to the transmitting operation, the image signal from the CIS is converted to a binary signal in the DMA mode via the 1 chip fax engine (FC100M) which is then sent to the image buffer of the RAM. Next, the data is transferred to the recording processor in the DMA mode to send the image data to the thermal head which is printed line by line. The copying takes place as the operation is repeated.

[2] Circuit description of control PWB

1. General description

Fig. 2 shows the functional blocks of the control PWB, which is composed of 4 blocks.

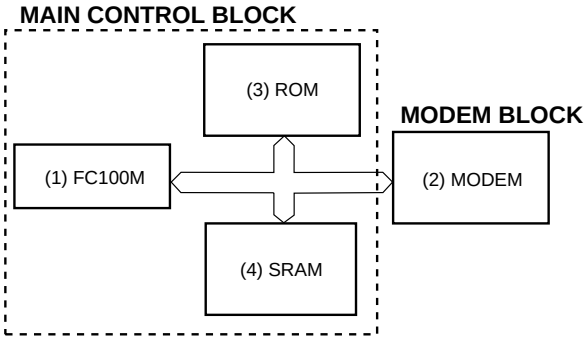


Fig. 2 Control PWB functional block diagram

2. Description of each block

(1) Main control block

The main control block is composed of ROCKWELL 1 chip fax engine (FC100M), ROM (2Mbit), SRAM (1Mbit) and Modem (R96DFXL-CID). Devices are connected to the bus to control the whole unit.

1) FC100M (IC9) : pin-144 QFP (FAX CONTROLLER)

2) R96DFXL-CID (IC6) : pin-100 QFP (MODEM)

The FAXENGINE Integrated Facsimile Controllers.

FC100M, contains an internal 8 bit microprocessor with an external 2 Mbyte address space and dedicated circuitry optimized for facsimile image processing and facsimile machine control and monitoring.

3) 27C020 (IC4): pin-32 DIP (ROM)

EPROM of 2Mbit equipped with software for the main CPU.

4) W24010S-70LE (IC2): pin-32 SOP (SRAM)

Line memory for the main CPU system RAM area and coding/decoding process. Used as the transmission buffer.

Memory of recorded data such as daily report and auto dials. When the power is turned off, this memory is backed up by the lithium battery.

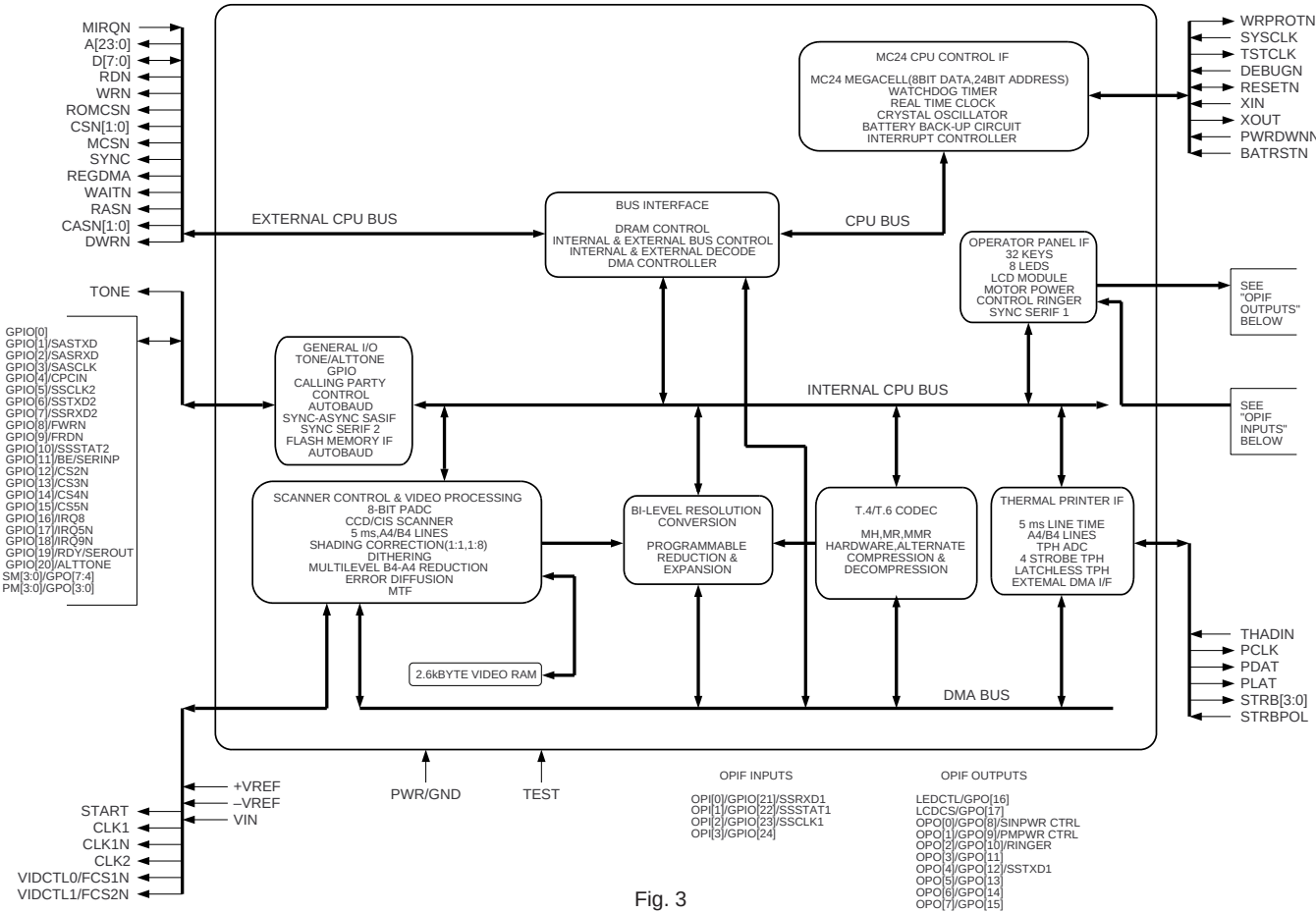


Fig. 3

FC100M (IC9) Terminal descriptions

Pin Name	Pin No.	I/O	Input Type	Output Type	Pin Description (Note: Active low signals have an "n" pin name ending.)
CPU Control Interface					
MIRQn	135	I	HU	–	Modem interrupt, active low. (Hysteresis In, Internal Pullup.)
SYSCCLK	133	I	H	–	System clock. (Hysteresis In.)
TSTCLK	130	O	–	123XT	Test clock.
Bus Control Interface					
A[23:0]	[1:6][8:13] [15:20][22:27]	O	TU	123XT	Address bus (24-bit).
D[7:0]	[136:139] [141:144]	I/O	TU	123XT	Data bus (8-bit).
RDn	128	O	–	123XT	Read strobe.
WRn	127	O	–	123XT	Write strobe.
ROMCSn	120	O	–	123XT	ROM chip select.
CS1n	122	O	–	123XT	I/O chip select.
CS0n	57	O	–	123XT	SRAM chip select. (Battery powered.)
MCSn	121	O	–	123XT	Modem chip select.
SYNC	126	O	–	123XT	Indicates CPU op code fetch cycle (active high).
REGDMA	124	O	–	123XT	Indicates REGSEL cycle and DMA cycle.
WAITn	125	O	–	123XT	Indicates current TSTCLK cycle is a wait state or a halt state.
RASn	113	O	–	123XT	DRAM row address select. (Battery powered.)
CAS[1:0]n	[111:112]	O	–	123XT	DRAM column address select. (Battery powered.)
DWRn	109	O	–	123XT	DRAM write. (Battery powered.)
Prime Power Reset Logic and Test					
DEBUGn	129	I	HU	–	External non-maskable input (NMI).
RESETn	131	I/O	HU	2XO	FC100/FC200 Reset.
TEST	58	I	C	–	Sets Test mode (Battery powered).
Battery Power Control and Reset Logic					
XIN	59	I	OSC	–	Crystal oscillator input pin.
XOUT	60	O	–	OSC	Crystal oscillator output pin.
PWRDWNn	62	I	H	–	Used by external system to indicate -to FC100/FC200 - loss of prime power. (Results in NMI)
BATRSTn	61	I	H	–	Battery power reset input.
WRPROTn	110	O	–	1XC	(Battery powered.) Write protect during loss of VDD power. NOTE: The functional logic is powered by battery power, but the output drive is powered by DRAM battery power.
Scanner Interface					
START	101	O	–	2XS	Scanner shift gate control.
CLK1	100	O	–	2XS	Scanner clock.
CLK1n	99	O	–	2XS	Scanner clock-inverted.
CLK2	98	O	–	2XS	Scanner reset gate control (or clock for CIS scanner).
FCS1n/VIDCTL0	96	O	–	2XT	Flash memory chip select or Video Control signal.
FCS2n/VIDCTL1	97	O	–	2XT	Flash memory chip select or Video Control signal.
Printer Interface					
PCLK/DMAACK	29	O	–	3XC	Thermal Print Head (TPH) clock, or external DMAACK.
PDAT	30	O	–	2XP	Serial printing data (to TPH).
PLAT	31	O	–	3XP	TPH data latch.
STRB[3:0]	[33:36]	O	–	1XP	Strobe signals for the TPH.
STRBPOL/DMAREQ	37	I	C	–	Sets strobe polarity, active high/low or external DMA request.
Operator Panel Interface					
OPO[0]/GPO[8]/ SMPWRCTRL	47	O	–	2XL	Keyboard/LED strobe [0] or GPO[8] or Scan Motor Power Control
OPO[1]/GPO[9]/ PMPWRCTRL	46	O	–	2XL	Keyboard/LED strobe [1] or GPO[9] or Print Motor Power Control
OPO[2]/GPO[10]/ RINGER	44	O	–	2XCT	Keyboard/LED strobe [2] or GPO[10] or RINGER
OPO[3]/GPO[11]	43	O	–	2XL	Keyboard/LED strobe [3] or GPO[11]
OPO[4]/GPO[12]/ SSTXD1	42	O	–	2XL	Keyboard/LED strobe [4] or GPO[12] or SSTXD1 (for SSIF1)
OPO[5]/GPO[13]	40	O	–	2XL	Keyboard/LED strobe [5] or GPO[13]
OPO[6]/GPO[14]	39	O	–	2XL	Keyboard/LED strobe [6] or GPO[14]
OPO[7]/GPO[15]	38	O	–	2XL	Keyboard/LED strobe [7] or GPO[15]
OPI[0]/GPIO[21]/ SSRXD1	52	I/O	HU	2XC	(Pullup, Hysteresis In) Keyboard return [0] or GPIO[21] or SSRXD1 (for SSIF1)
OPI[1]/GPIO[22]/ SSSTAT1	51	I/O	HU	2XC	(Pullup, Hysteresis In) Keyboard return [1] or GPIO[22] or SSSTAT1 (for SSIF1)

FC100M (IC9) Terminal descriptions

Pin Name	Pin No.	I/O	Input Type	Output Type	Pin Description
Operator Panel Interface					
OPI[2]/GPIO[23]/SSCLK1	50	I/O	HU	2XC	(Pullup, Hysteresis In) Keyboard return [2] or GPIO[23] or SSCLK1 (for SSIF1)
OPI[3]/GPIO[24]	49	I/O	HU	2XC	(Pullup, Hysteresis In) Keyboard return [3] or GPIO[24]
LEDCTL	55	O	–	4XC	Indicates outputs OPO[7:0] are for LEDs.
LCDCS	54	O	–	1XC	LCD chip select.
General Purpose I/O					
GPIO[0]	94	I/O	H	2XC	(Hysteresis In) GPIO[0].
GPIO[1]/SASTXD	93	I/O	H	2XC	(Hysteresis In) GPIO[1] or SASTXD (for SERIF).
GPIO[2]/SASRXD	92	I/O	H	2XC	(Hysteresis In) GPIO[2] or SASRXD (for SERIF).
GPIO[3]/SASCLK	91	I/O	H	2XC	(Hysteresis In) GPIO[3] or SASCLK (for SERIF).
GPIO[4]/CPCIN	90	I/O	H	2XC	(Hysteresis In) GPIO[4] or Calling Party Control Input.
GPIO[5]/SSCLK2	89	I/O	H	2XC	(Hysteresis In) GPIO[5] or SSCLK2 (for SSIF2).
GPIO[6]/SSTXD2	87	I/O	H	2XC	(Hysteresis In) GPIO[6] or SSTXD2 (for SSIF2).
GPIO[7]/SSRXD2	86	I/O	H	2XC	(Hysteresis In) GPIO[7] or SSRXD2 (for SSIF2).
GPIO[8]/FWRn	85	I/O	H	2XC	(Hysteresis In) GPIO[8] or flash write enable signal for NAND-type flash memory.
GPIO[9]/FRDn	84	I/O	H	2XC	(Hysteresis In) GPIO[9] or flash read enable signal for NAND-type flash memory.
GPIO[10]/SSSTAT2	83	I/O	H	2XC	(Hysteresis In) GPIO[10] or SSSTAT2 (for SSIF2).
GPIO[11]/BE/SERINP	82	I/O	H	1XC	(Hysteresis In) GPIO[11] or bus enable or serial port data input for autobaud detection.
GPIO[12]/CS[2]n	80	I/O	H	2XC	(Hysteresis In) GPIO[12] or I/O chip select [2].
GPIO[13]/CS[3]n	79	I/O	H	2XC	(Hysteresis In) GPIO[13] or I/O chip select [3].
GPIO[14]/CS[4]n	78	I/O	H	2XC	(Hysteresis In) GPIO[14] or I/O chip select [4].
GPIO[15]/CS[5]n	77	I/O	H	2XC	(Hysteresis In) GPIO[15] or I/O chip select [5].
GPIO[16]/IRQ[8]	76	I/O	H	1XC	(Hysteresis In) GPIO[16] or external interrupt 8.
GPIO[17]/IRQ[5]n	75	I/O	H	1XC	(Hysteresis In) GPIO[17] or external interrupt 5.
GPIO[18]/IRQ[9]n	74	I/O	H	1XC	(Hysteresis In) GPIO[18] or external interrupt 9.
GPIO[19]/RDY/SEROUT	73	I/O	H	1XC	(Hysteresis In) GPIO[19] or ready signal or Serial port data output for autobaud detection.
GPIO[20]/ALTTONE	107	I/O	H	1XC	(Hysteresis In) GPIO[20] or ALTTONE.
Miscellaneous					
SM[3:0]/GPO[7:4]	[103:106]	O	–	1XC	Programmable: scan motor control pins or GPO pins.
PM[3:0]/GPO[3:0]	[115:118]	O	–	1XC	Programmable: print motor control pins or GPO pins.
TONE	119	O	–	1XC	Tone output signal.
Power, Reference Voltages, Ground					
-Vref/CLREF	66	I	-VR	–	Negative Reference Voltage for Video A/D or Reference Voltage for the Clamp Circuit.
ADXG	68	I	VXG	–	A/D Internal GND. (NOTE: This pin requires an external 0.22μF decoupling capacitor to ADGA.)
ADGA	69		VADG		A/D Analog Ground
ADVA	70		VADV		A/D Analog Power
ADGD	72		VADG		A/D Digital Ground
+Vref	71	I	+VR		Positive Reference Voltage for Video A/D.
VIN	67	I	VA	–	Analog Video A/D input.
THADI	65	I	TA	–	Analog Thermal A/D input.
Power and Ground					
VSS(12)	7,21,28,45,53,56,64,88,95,108,132,134				Digital Ground
VDD(8)	14,32,41,48,81,102,123,140				Digital Power
VBAT	63				Battery Power
VDRAM	114				DRAM Battery Power

(2) Panel control block

The following controls are performed by the FC100M.

- Operation panel key scanning
- Operation panel LCD display

(3) Mechanism/recording control block

- Recording control block diagram (1)

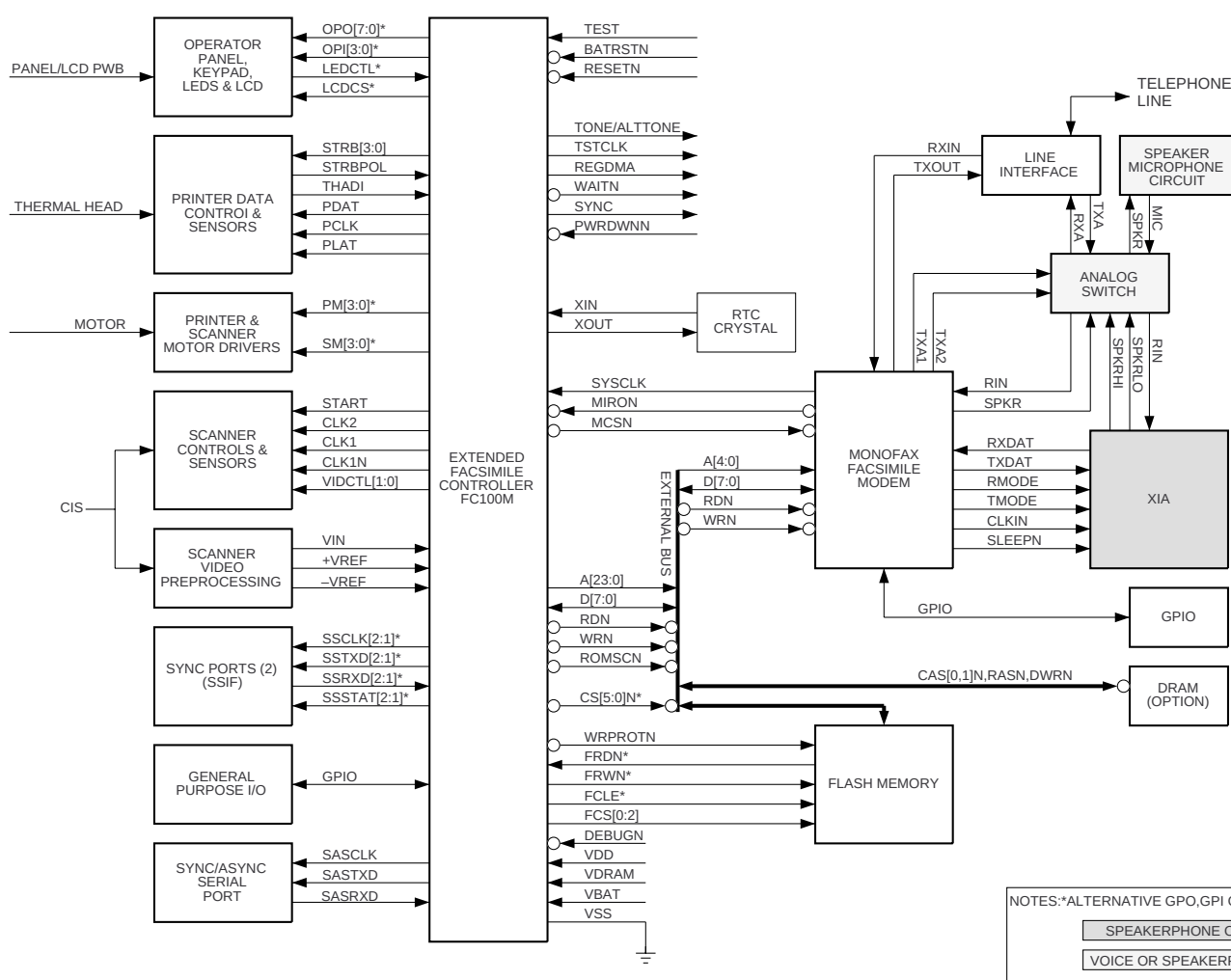


Fig. 4

(4) Modem (R96DFXL-CID) block

INTRODUCTION

The Rockwell R96DFXL-CID MONOFAX modem is a synchronous 9600 bits per second (bps) half-duplex modem with error detection and DTMF reception. It has low power consumption and requires only a single +5V DC power supply. The modem is housed in a single VLSI device package.

The modem can operate over the public switched telephone network (PSTN) through line terminations provided by a data access arrangement (DAA).

The R96DFXL-CID is designed for use in Group 3 facsimile machines. The modem satisfies the requirements specified in CCITT recommendations V.29, V.27 ter, V.21 Channel 2 and T.4, and meets the binary signaling requirements of T.30.

The modem can operate at 9600, 7200, 4800, 2400, or 300 bps, and also includes the V.27 ter short training sequence option.

The modem can also perform HDLC framing according to T.30 at 9600, 7200, 4800, 2400, or 300 bps.

The modem features a programmable DTMF receiver and three programmable tone detectors which operate concurrently with the V.21 channel 2 receiver.

The voice mode allows the host computer to efficiently transmit and receive audio signals and messages.

The modem is available in either a 100-pin plastic quad flat pack (PQFP) or a 64-pin quad in-line package (QUIP).

General purpose input/output (GPIO) pins are available for host as signment in the 100-pin PQFP.

The modem's small size, single voltage supply, and low power consumption allow the design of compact system enclosures for use in both office and home environments.

MONOFAX is a registered trademark of Rockwell International.

FEATURES

- Group 3 facsimile transmission/reception
 - ITU-TS V.29, V.27 ter, T.30, V.21 Channel 2, T.4
 - HDLC Framing at all speeds
- V.27 ter short train
- Concurrent DTMF, FSK, and tone reception
- Voice mode transmission/reception
- Half-duplex (2-wire)
- Programmable maximum transmit level:
 - 0 dBm to –15 dBm
- Programmable transmit analog attenuation:
 - 0 dB to 14 dB in 2 dB steps
- Receive dynamic range: 0 dBm to –43 dBm
- Programmable dual tone generation
- Programmable tone detection
- Programmable turn-on and turn-off thresholds
- Programmable interface memory interrupt
- Diagnostic capability
 - Allows telephone line quality monitoring
- Equalization
 - Automatic adaptive equalizer
 - Fixed digital compromise equalizer
- DTE interface: two alternate ports
 - Selectable microprocessor bus (6500 or 8085)
 - CCITT V.24 (EIA-232-D compatible) interface
- TTL and CMOS compatible
- Low power consumption: 275 mW (typical)
- Single Package
 - 100-pin PQFP
 - 64-pin QUIP
- Single +5VDC power supply
- Software compatible with R96MFX, R96EFX, R96SHF, and R96VFX modems

R96DFXL-CID (IC6) Hardware Interface Signals

Pin Signals – 100-Pin PQFP

Pin No.	Signal Name	I/O Type
1	GP03	IA/OB
2	GP04	IA/OB
3	GP05	IA/OB
4	GP06	IA/OB
5	GP07	IA/OB
6	0VD2	GND
7	0VD2	GND
8	D7	IA/OB
9	D6	IA/OB
10	D5	IA/OB
11	D4	IA/OB
12	D3	IA/OB
13	D2	IA/OB
14	D1	IA/OB
15	D0	IA/OB
16	0VD2	GND
17	0VA	GND
18	RAMPIN	R
19	NC	
20	NC	
21	0VA	GND
22	+5VD2	PWR
23	0VD1	GND
24	SWGAINI	R
25	ECLKIN1	R
26	SYNCIN1	R
27	NC	
28	NC	
29	NC	
30	0VA	GND
31	NC	
32	NC	
33	NC	
34	DAIN	R
35	ADOUT	R
36	BYPASS	IC
37	RCVI	R
38	TXLOSS3	IC
39	TXLOSS2	IC
40	TXLOSS1	IC
41	NC	
42	NC	
43	0VA	GND
44	TXOUT	AA
45	RXIN	AB
46	+5VA	PWR
47	0VA	GND
48	AGD	R
49	AOUT	R
50	0VD1	GND
51	NC	
52	IRQ	OC
53	WRITE-R/W	IA
54	CS	IA
55	READ-φ2	IA
56	RS4	IA
57	RS3	IA
58	RS2	IA
59	RS1	IA

Pin No.	Signal Name	I/O Type
60	RS0	IA
61	GP13	IA/OB
62	NC	
63	GP11	IA/OB
64	RTS	IA
65	EN85	R
66	0VD2	GND
67	PORI	ID
68	XTLI	R
69	XTLO	R
70	XCLK	OD
71	YCLK	OD
72	+5VD1	PWR
73	DCLK1	R
74	SYNCIN2	R
75	GP16	IA/OB
76	GP17	IA/OB
77	0VD2	GND
78	CTS	OA
79	TXD	IA
80	0VD2	GND
81	0VD2	GND
82	DCLK	OA
83	EYESYNC	OA
84	EYECLKX	OA
85	EYECLK	OA
86	EYEX	OA
87	ADIN	R
88	DAOUT	R
89	0VD2	GND
90	EYEX	OA
91	GP21	IA/OB
92	0VD2	GND
93	GP20	IA/OB
94	GP19	IA/OB
95	RXD	OA
96	RLSD	OA
97	0VD2	GND
98	RCVO	R
99	SWGAINO	R
100	GP02	IA/OB

Notes:

1. NC = No connection; leave pin disconnected (open).
2. I/O Type: = Digital signals: see Table 9;
Analog signals: see Table 10.
3. R = Required modem inter-connection; no connection to host equipment.

[3] Circuit description of TEL/LIU PWB

(1) TEL/LIU block operational description

1) Block diagram

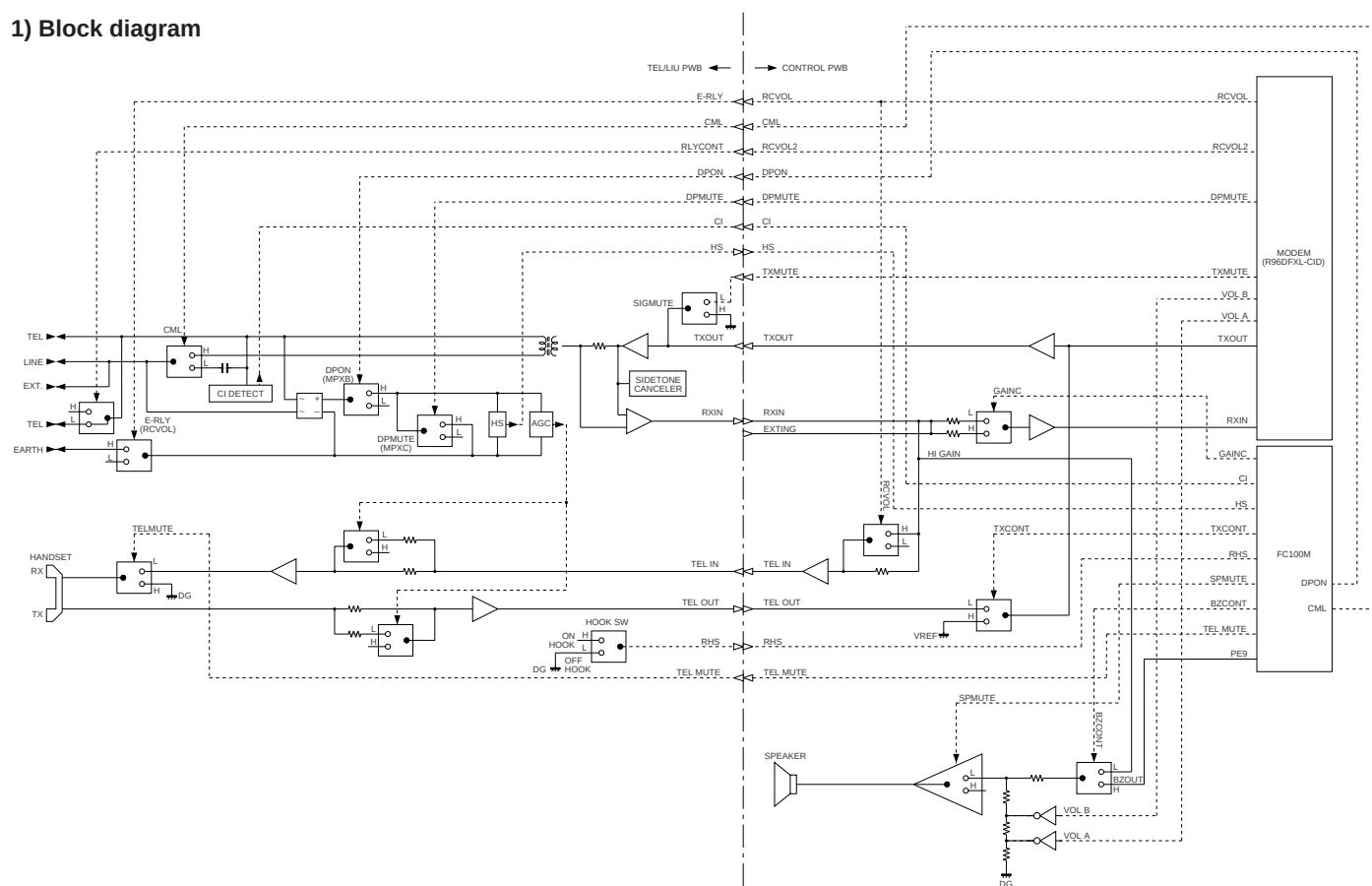


Fig. 5

2) Circuit description

The TEL/LIU PWB is composed of the following 10 blocks.

1. Surge protection circuit
2. Noise filter
3. Dial pulse generation circuit
4. CML relay
5. Matching transformer
6. Hybrid circuit
7. Signal selection
8. Sensor circuit
9. CI detection circuit
10. Power supply and bias circuit

3) Block description

1. Surge Protection circuit

This circuit protects the circuit from the surge voltage occurring on the telephone line.

- The AR1, AR2 protects the circuit from the 425V or higher line surge voltages.

2. Noise filter

The noise filter comprises the RF choke coil, L6, L7 and L8.

3. Dial pulse generation circuit

The pulse dial generation circuit comprises the photo-coupler PC2, PC3, polarity guard REC1, and resistor R1.

The photo-coupler PC3 shunts the line current using the DP signal before transmitting the dial signal, then turns off the CML relay.

After the pulse dial signal is transmitted by turning on/off the DP signal, the CML relay is turned on again.

4. CML relay

The CML relay switches over connection to the matching transformer T1 while the FAX or built-in telephone is being used.

5. Matching transformer

The matching transformer performs electrical insulation from the telephone line and impedance matching for transmitting the TEL/FAX signal.

6. Hybrid circuit

The hybrid circuit performs 2-wire-to-4-wire conversion using the IC102 of operational amplifier, transmits the voice transmission signal to the line, and feeds back the voice signal to the voice reception circuit as the side tone.

7. Signal selection

The following signals are used to control the transmission line of TEL/LIU signal. For details, refer to the signal selector matrix table.

8. Sensor circuit

For the recording paper sensor ($\overline{PE}$), when there is recording paper, the photo transistor in the light receiving side is ON and the detection level is LOW. When there is no recording paper, the photo transistor in the light receiving side is OFF and the detection level is HIGH.

9. CI detection circuit

The CI detection circuit detects the CI signals. A CI signal, which is provided to the photo-coupler PC6 through the C3 (0.68 μ F), R3 (1 K), and ZD2 when the ring signal is inputted from the telephone line.

10. Power supply and bias circuits

The voltages of +5V and +24VA are supplied from the control PWB unit.

[Control signals from output port]

Signal Name	Description																														
CML (The circuit is located in the TEL/LIU PWB.)	<u>Line connecting relay and DP generating relay</u> H: Line make L: Line break																														
SP MUTE	<u>Speaker tone mute control signal</u> H: Muting (Power down mode) L: Muting cancel (Normal operation)																														
TEL MUTE	<u>Handset reception mute control signal</u> H: Muting L: Muting cancel																														
VOL A VOL B (The circuit is located in the control PWB.)	<u>Speaker volume control signal.</u> VOL A VOL B matrix <table><tr><td></td><td>VOL A</td><td>VOL B</td><td>RING. Receiving</td><td>Buzzer</td><td>DTMF</td></tr><tr><td></td><td>H</td><td>H</td><td>—</td><td>—</td><td>—</td></tr><tr><td></td><td>L</td><td>H</td><td>Low</td><td>—</td><td>Low</td></tr><tr><td></td><td>H</td><td>L</td><td>Middle</td><td>Fixed</td><td>Middle</td></tr><tr><td></td><td>L</td><td>L</td><td>High</td><td>—</td><td>High</td></tr></table>		VOL A	VOL B	RING. Receiving	Buzzer	DTMF		H	H	—	—	—		L	H	Low	—	Low		H	L	Middle	Fixed	Middle		L	L	High	—	High
	VOL A	VOL B	RING. Receiving	Buzzer	DTMF																										
	H	H	—	—	—																										
	L	H	Low	—	Low																										
	H	L	Middle	Fixed	Middle																										
	L	L	High	—	High																										
TXCONT (The circuit is located in the control PWB.)	<u>Handset transfer mute control signal</u> H: Signal sending, when transmitting L: During reception, transmission mute, (during standby)																														
GAIN-C (The circuit is located in the control PWB.)	<u>Reception gain switching signal</u> H: When connected to line, 1: 1 gain L: When not connected to line, HIGH gain																														
BZCONT (The circuit is located in the control PWB.)	<u>Speaker output signal switching</u> H: Buzzer signal output (during stand by) L: When monitoring line signal																														

UX-310DE
FO-730DE/NX-530DE

[Signals for status recognition according to input signals]

Signal Name	Function
$\overline{\text{RHS}}$	H: The handset is in the on-hook state. L: The handset is in the off-hook state.
CI	Incoming call (CI) detection signal
$\overline{\text{HS}}$	H: The handset or external telephone is in the on-hook state. L: The handset or external telephone is in the off-hook state.
P-E	H: Recording paper does not exist. L: Recording paper is set (exists). (Detection of recording paper in printing state)
P-IN	H: Recording paper does not exist in case of printing. L: Recording paper exists in case of printing. (Detection of recording paper in printing state)

[Other signals]

Signal Name	Function
TEL IN	Receiving signal from line or modem
TEL OUT	Transfer signal to line
TXOUT	Transmission (DTMF) analog signal output from modem
RXIN	Reception (DTMF, others) analog signal input into modem

NO	Signal Name (CNLIUA)	NO	Signal Name (CNLIUA)
1	TELOUT	8	RHS
2	TELIN	9	RXIN
3	TELMUTE	10	TXOUT
4	CI/CIDIN1	11	CML
5	CIDIN2/HS	12	+5V
6	P-E	13	DG
7	P-IN	14	+24VA

NO	Signal Name (CNLIUB)	NO	Signal Name (CNLIUB)
1	EXTSIG	4	DPON
2	RLYCNT	5	DPMUTE
3	SIGMUTE/TXMUTE	6	RCVOL

(Example: TEL speaking)

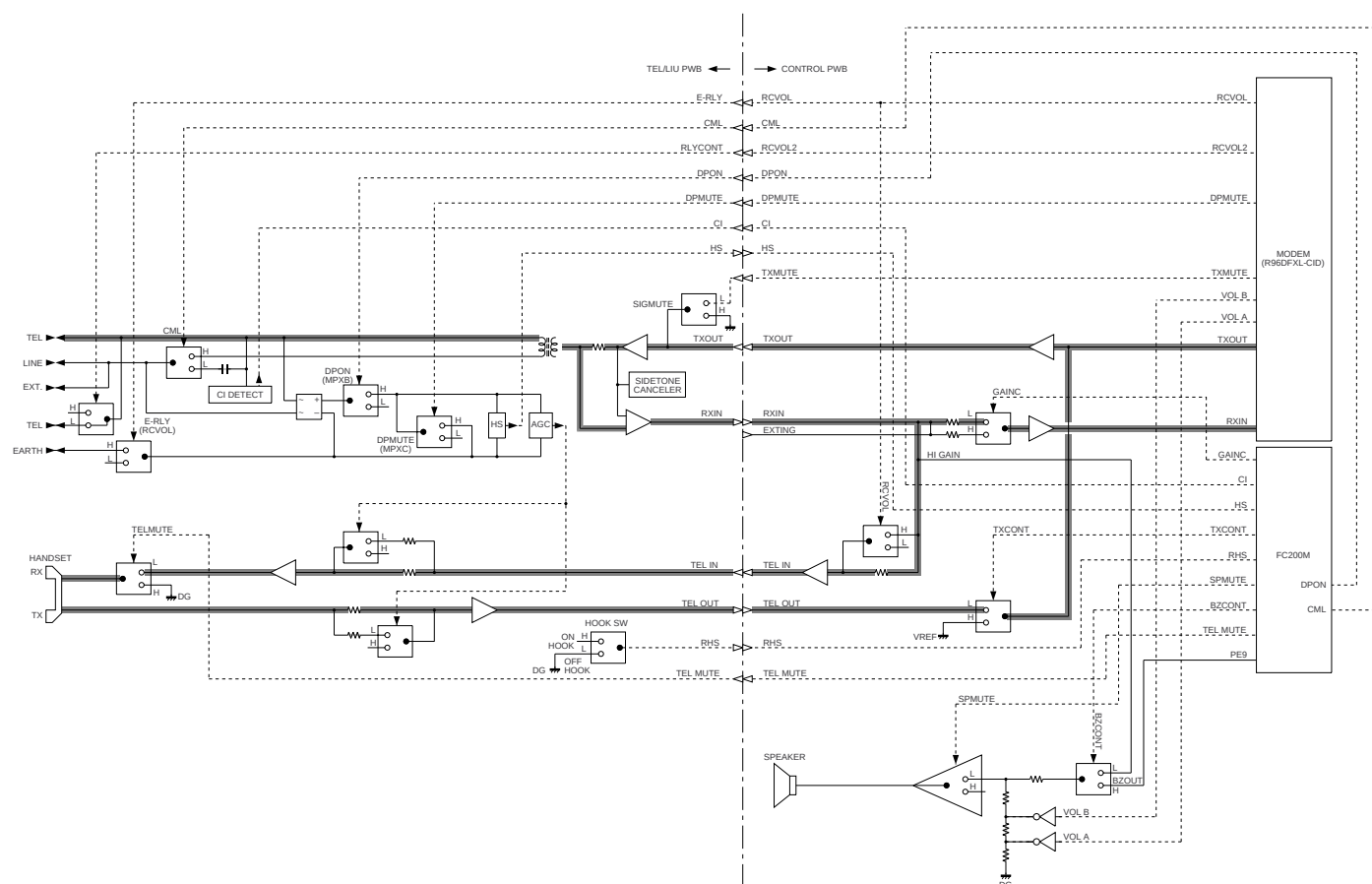


Fig. 6

[4] Circuit description of power supply PWB

1. Block diagram

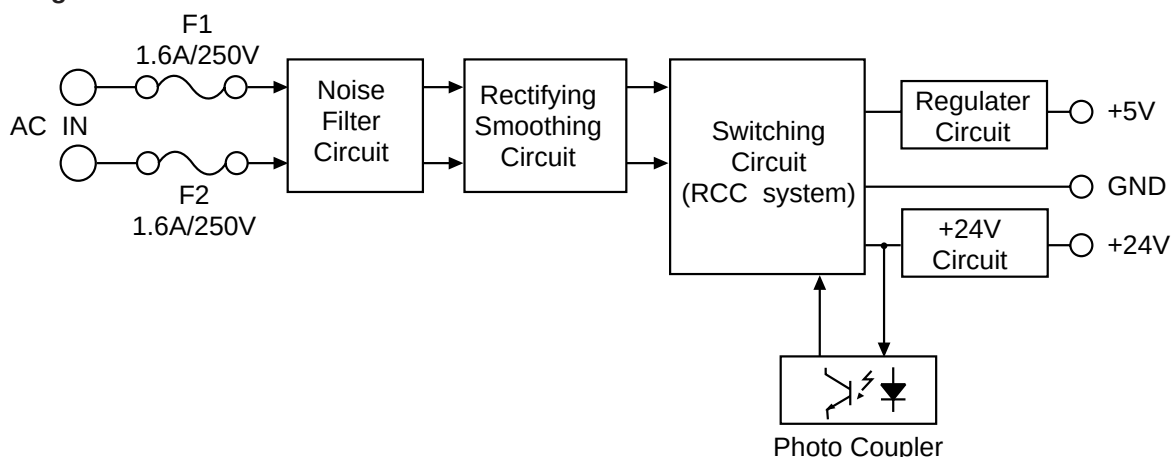


Fig. 7

2-1. Noise filter circuit

The input noise filter section is composed of L1, C1 and C15 that reduces normal mode noise from the AC line and common mode noise to the AC line.

2-2. Rectifying/smoothing circuit

The AC input voltage is rectified by diode D1, 2, 3, 4 and smoothed by capacitor C2 to supply DC voltage to switching circuit section.

Power thermistor TH1 suppresses inrush current at power switch-on.

2-3. Switching circuit

This circuit employs the self excited ringing choke convertor (RCC) system. In this system, the DC voltage supplied from the rectifying/smoothing section is converted to be the high frequency pulses by ON/OFF repetition of MOS FET Q1.

Energy is charged in the primary winding of T1 during ON period of Q1, and discharged to the secondary winding during OFF period of Q1.

The output voltage is controlled by adjusting ON period of Q1 which changes charge time of C8 through operation of photo-coupler PC1 from +24V output.

The overcurrent protection is performed by bringing Q1 to OFF state through detection of voltage increase in the auxiliary winding of T1 by ZD2, R5 and R6.

The overvoltage protection is performed by operating the overcurrent protection circuit through destruction of zener diode ZD4 and short-circuiting of load.

2-4. +5V circuit

Each DC voltage supplied by rectifying the output of transformer T1 with diode D8 is stabilized by 3-terminal regulator IC1.

[5] Circuit description of CIS unit

1. CIS

Cis is an image sensor which puts the original paper in close contact with the full-size sensor for scanning, being a monochromatic type with the pixel number of 1,728 dots and the main scanning density of 8 dots/mm.

It is composed of sensor, rod lens, LED light source, light-conductive plate, control circuit and so on, and the reading line and focus are previously adjusted as the unit.

Due to the full-size sensor, the focus distance is so short that the set is changed from the light weight type to the compact type.

2. Waveforms

The following clock is supplied from FC100M of the control board, and VO is output.

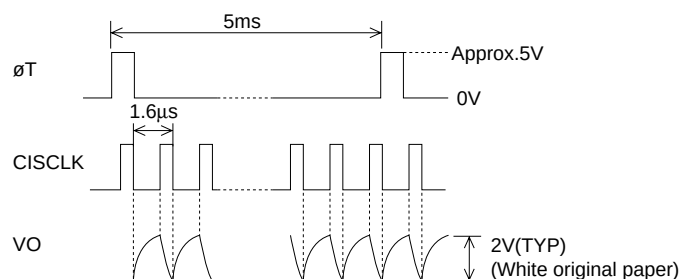
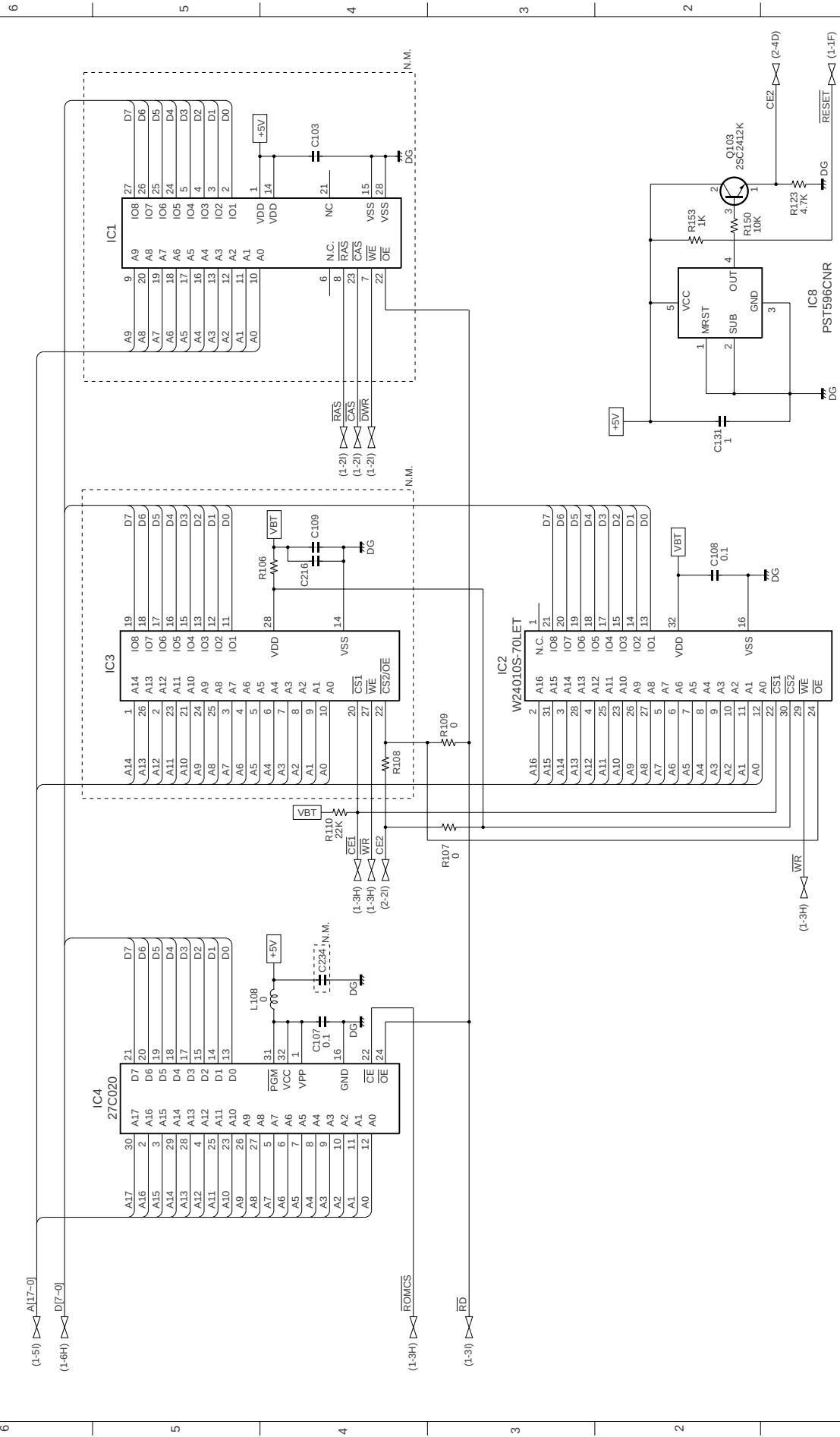


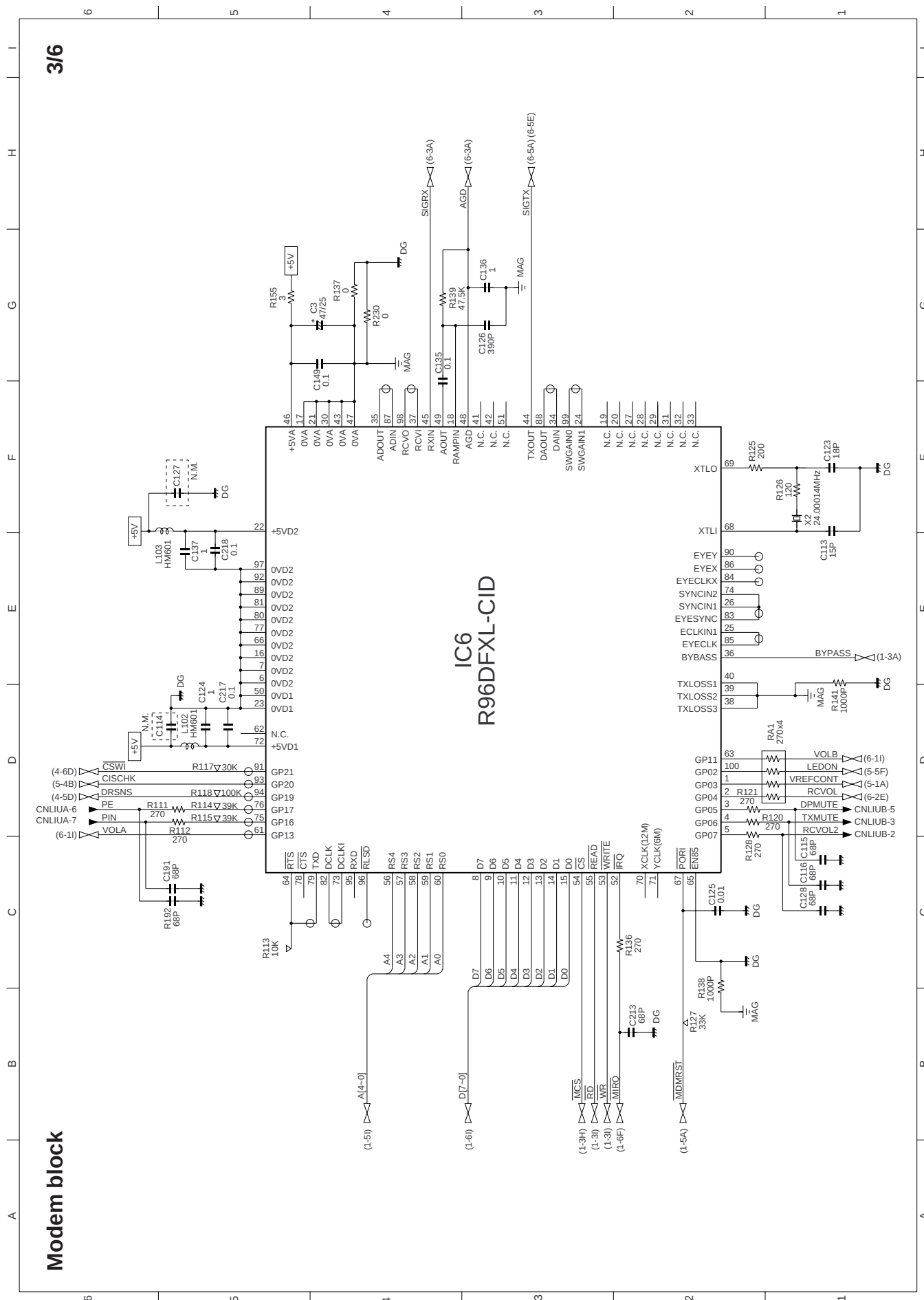
Fig. 8



Memory block

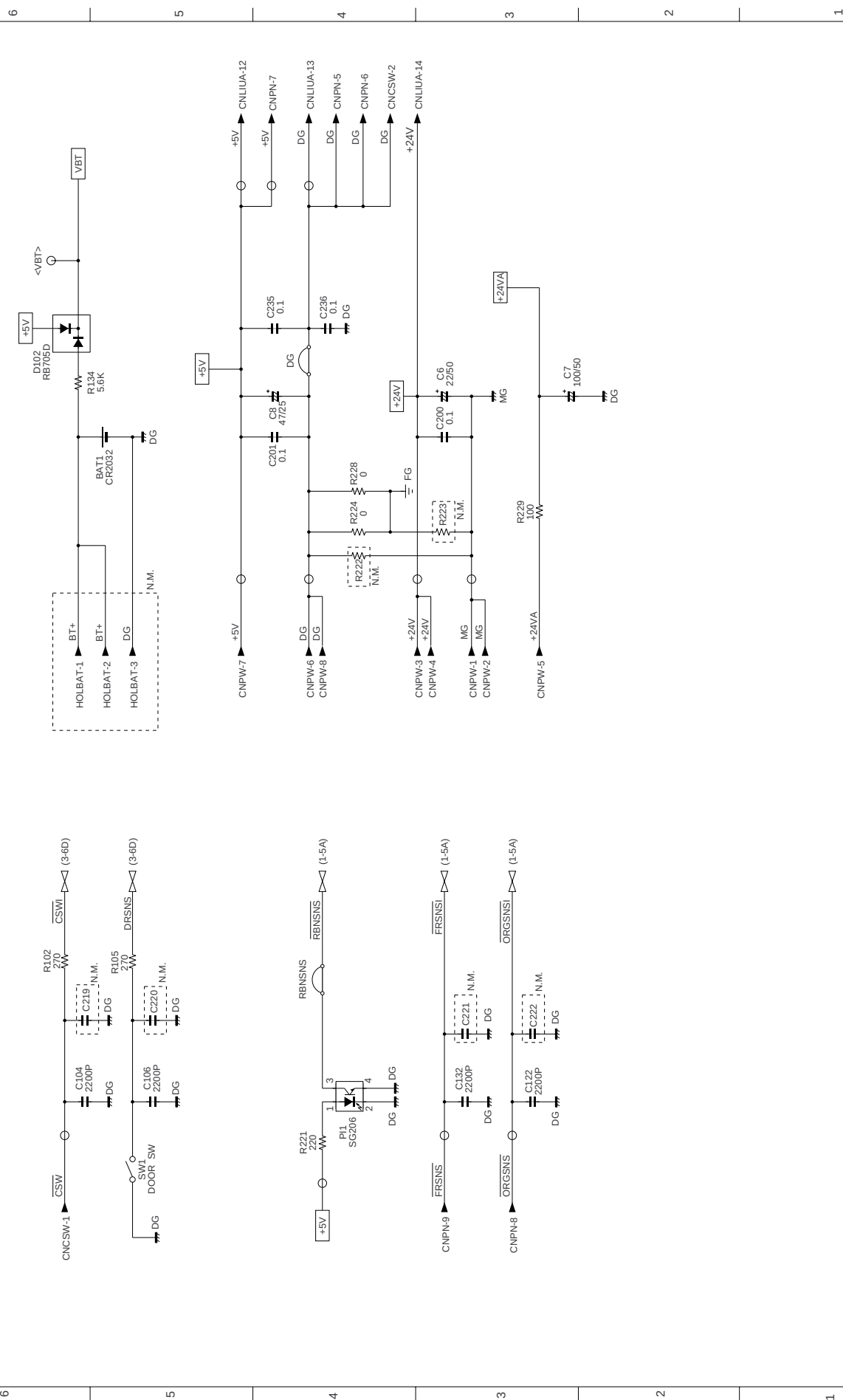
2/6



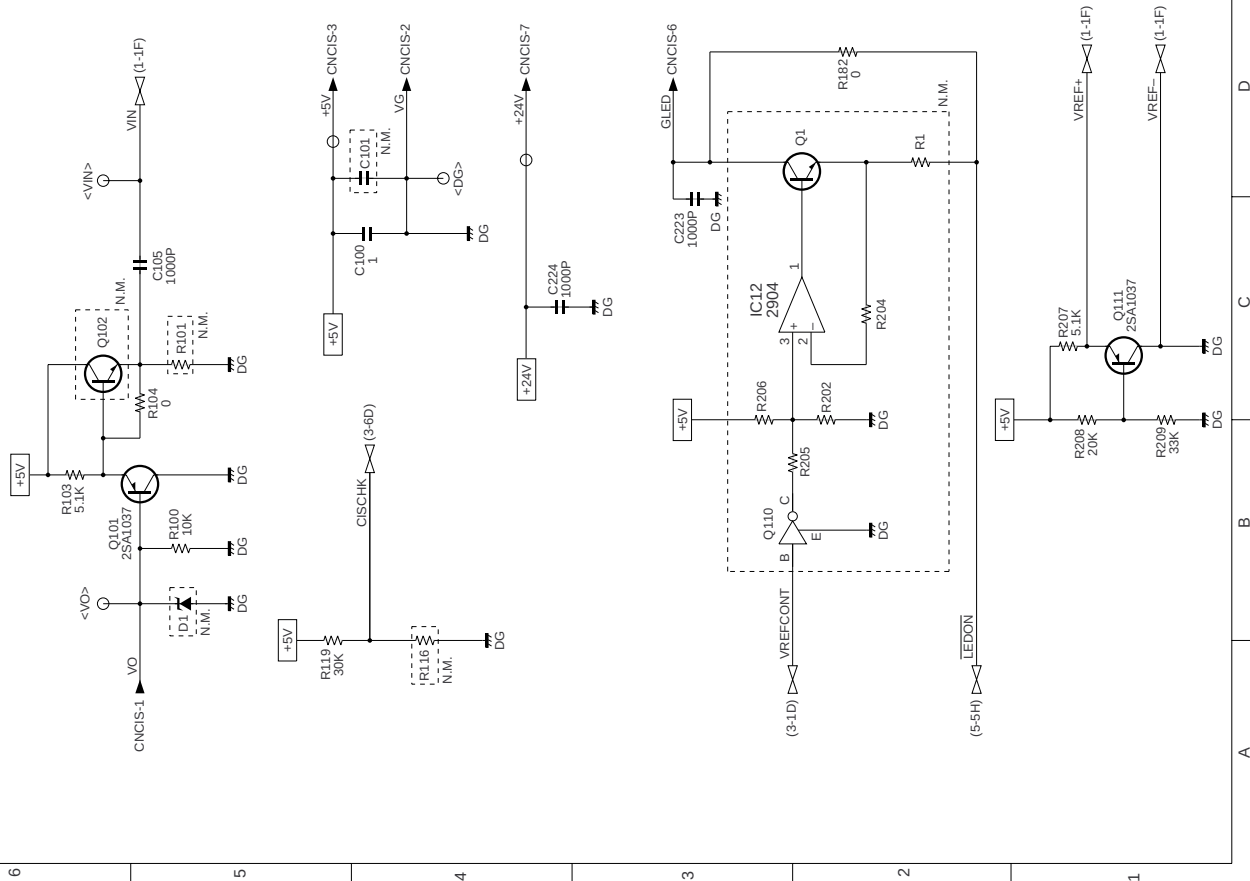


Sensor/Reset/Power supply block

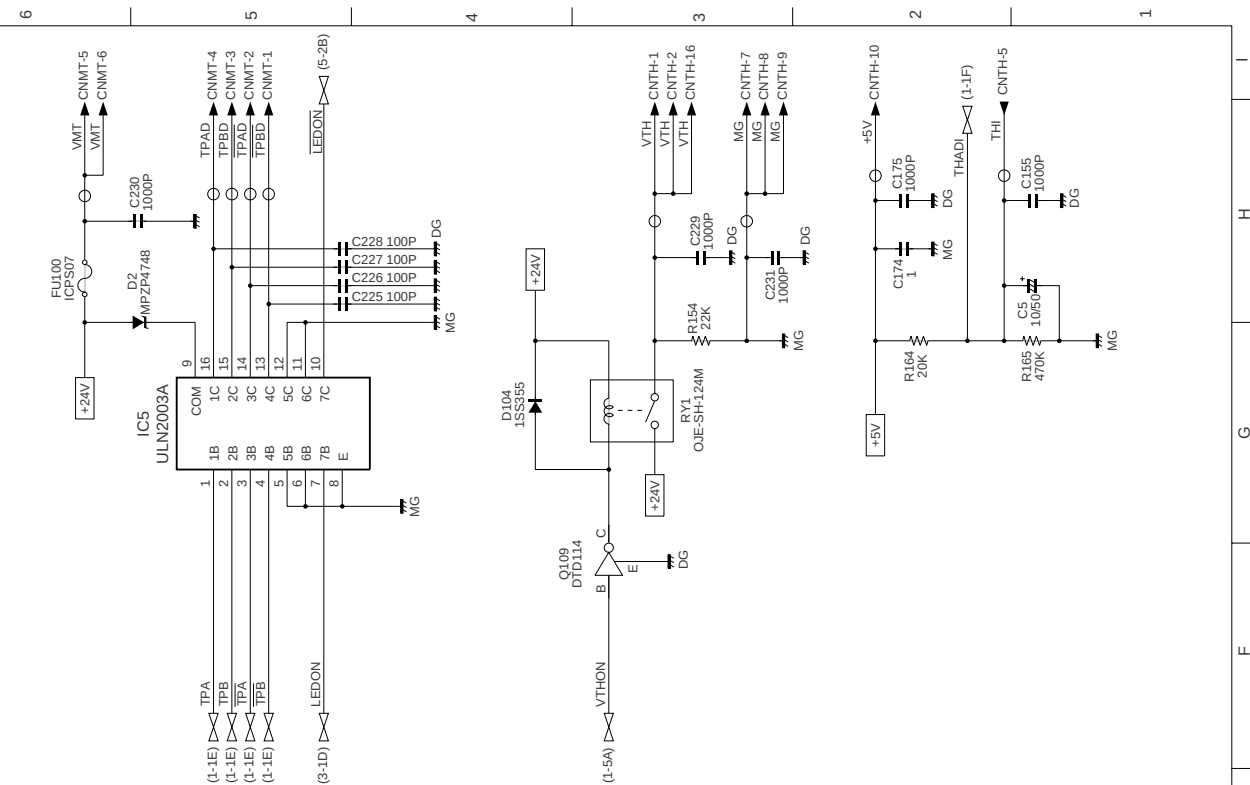
4/6



Video processing/Motor drive / Thermal block

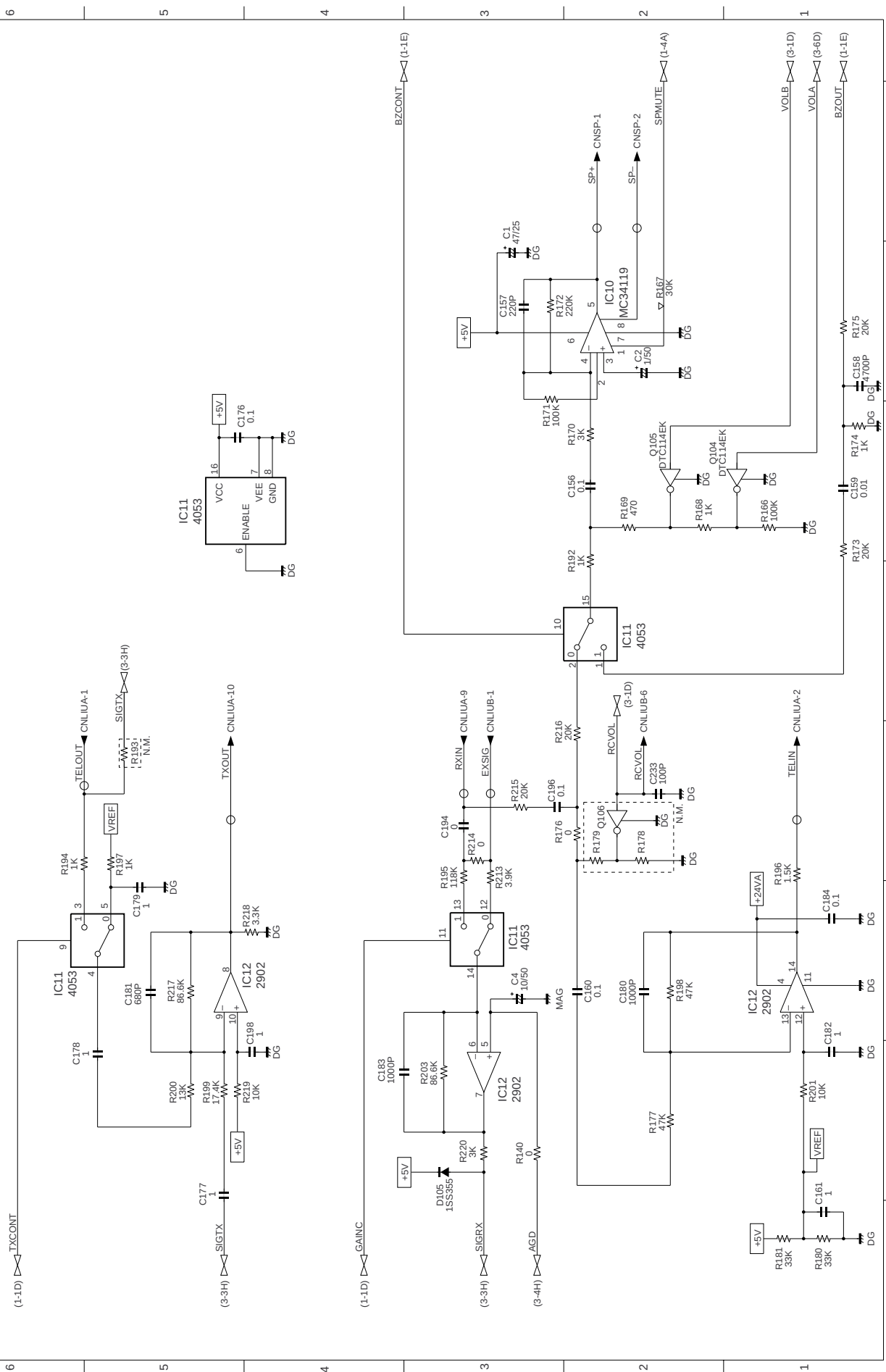


5/6



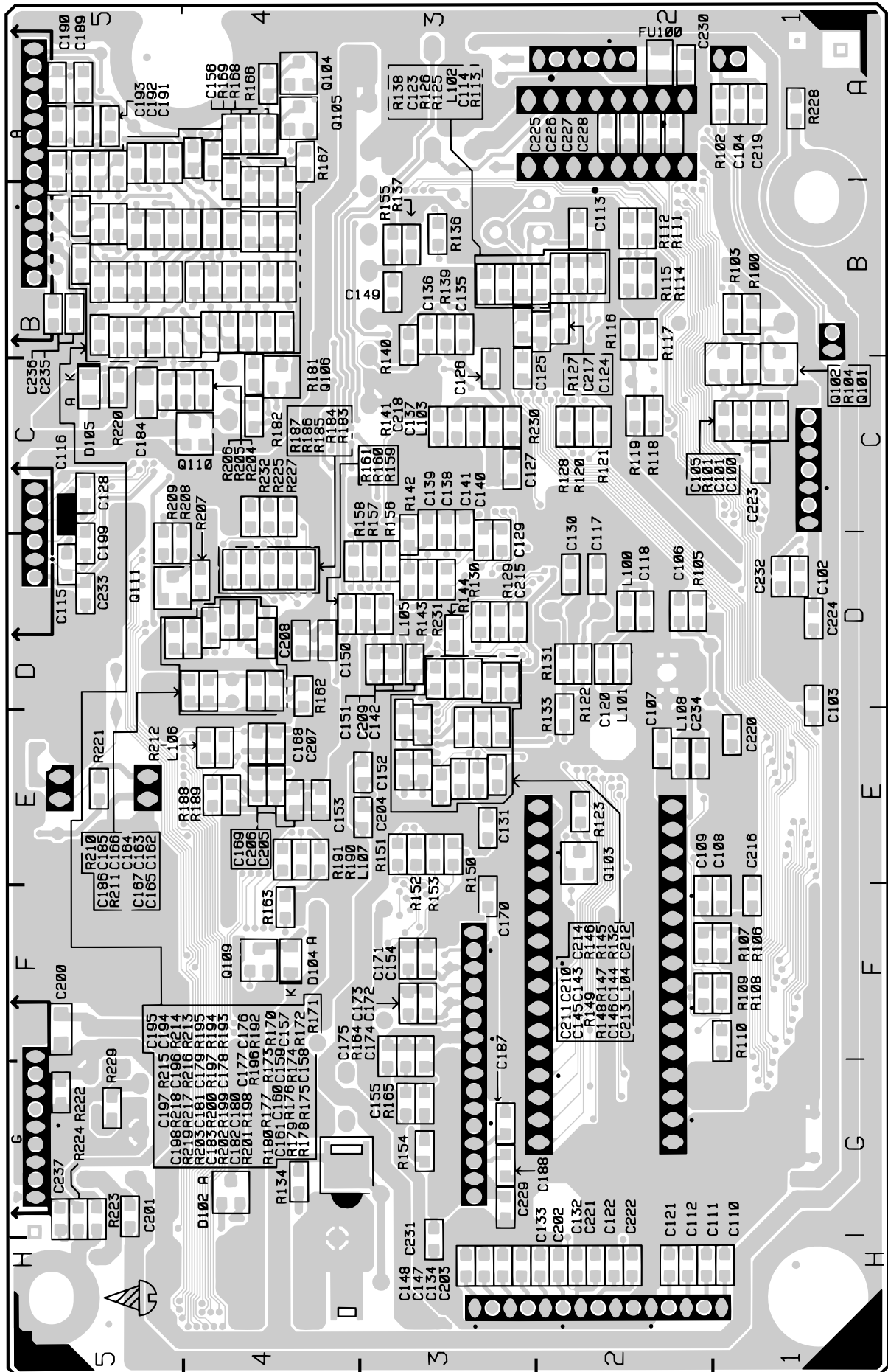
Analog signal block

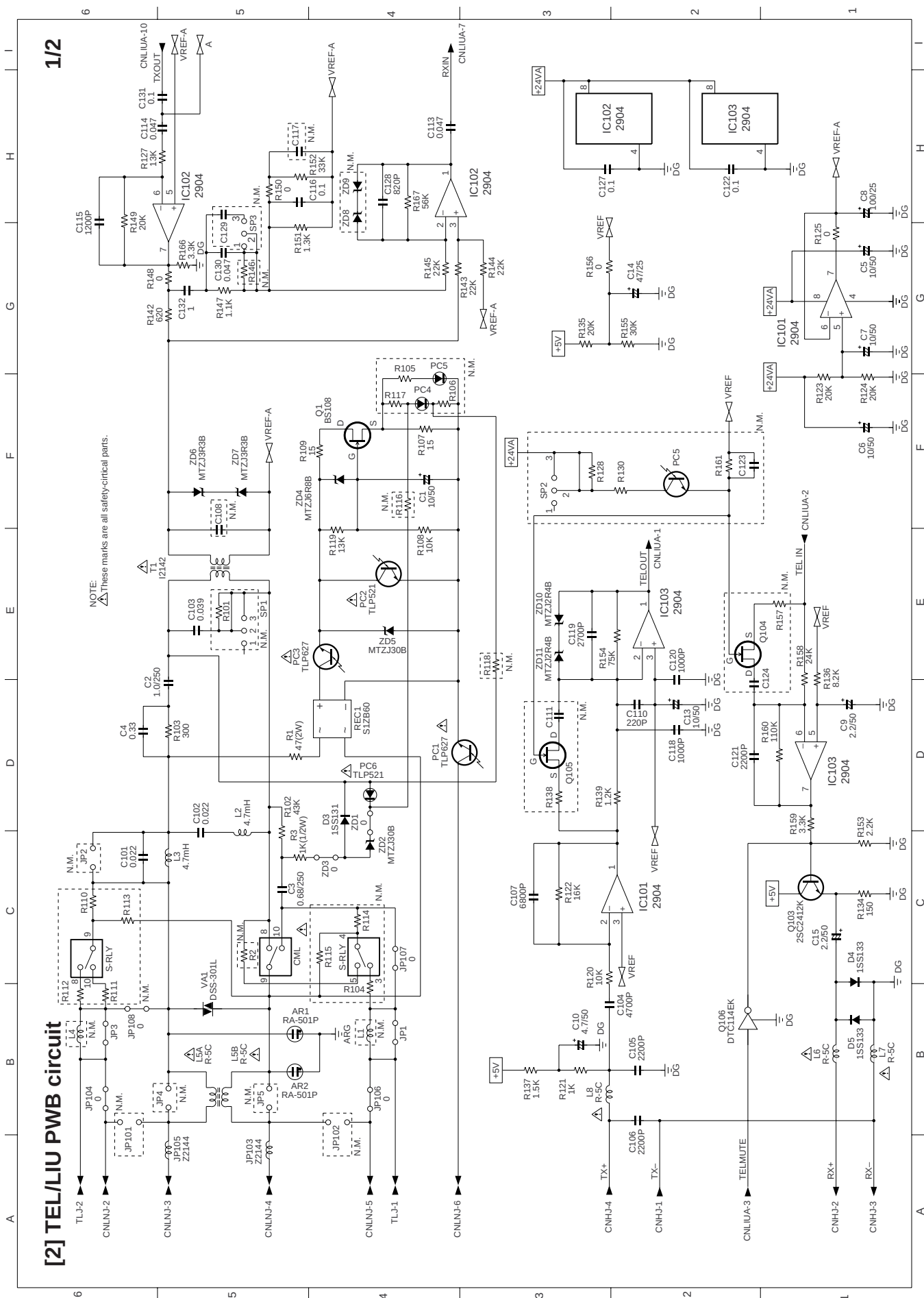
6/6





Control PWB parts layout (Bottom side)

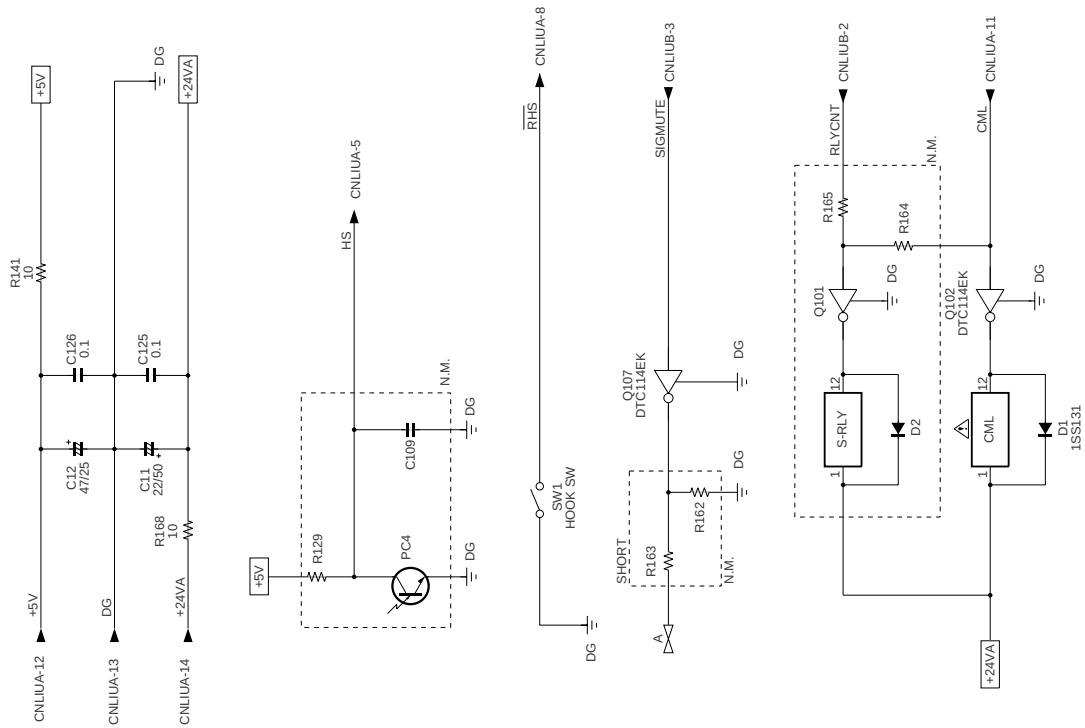




TEL/LIU PWB circuit

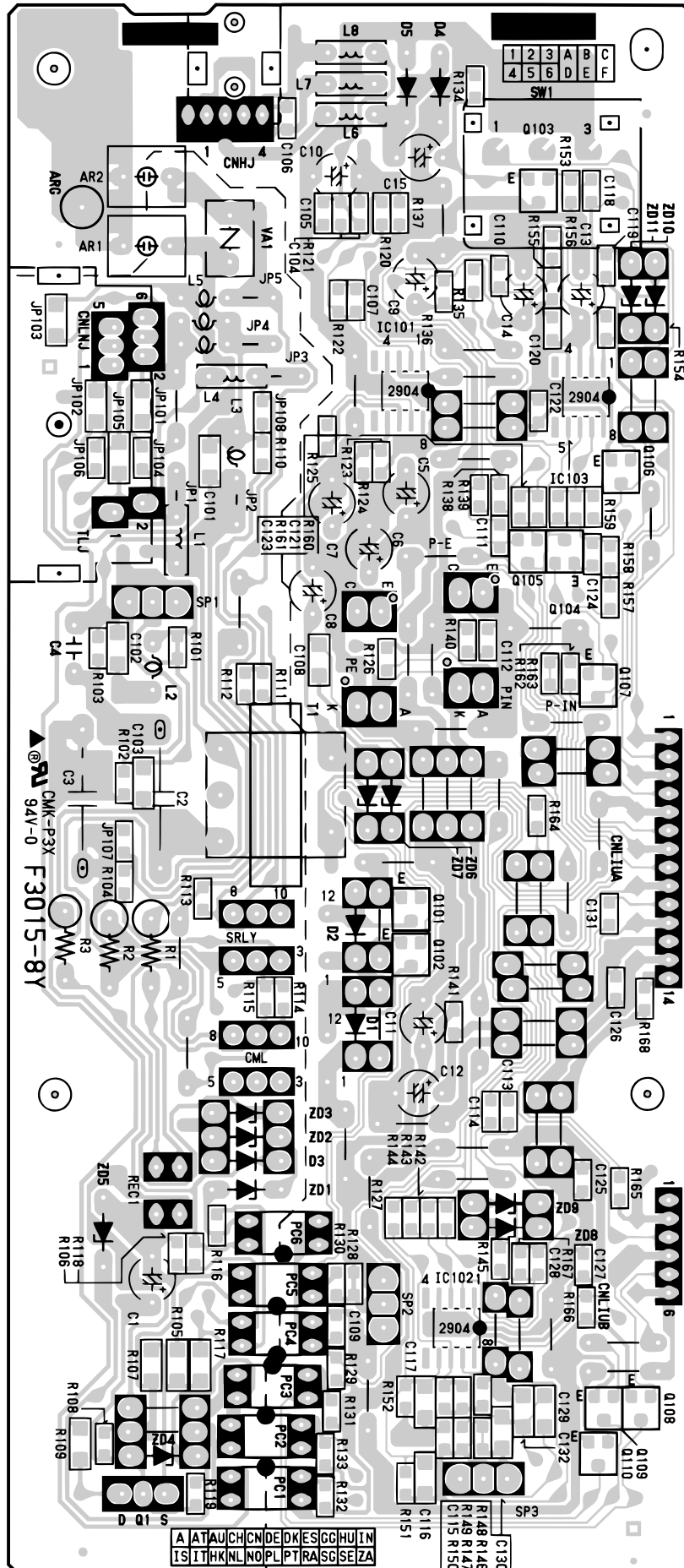
2/2

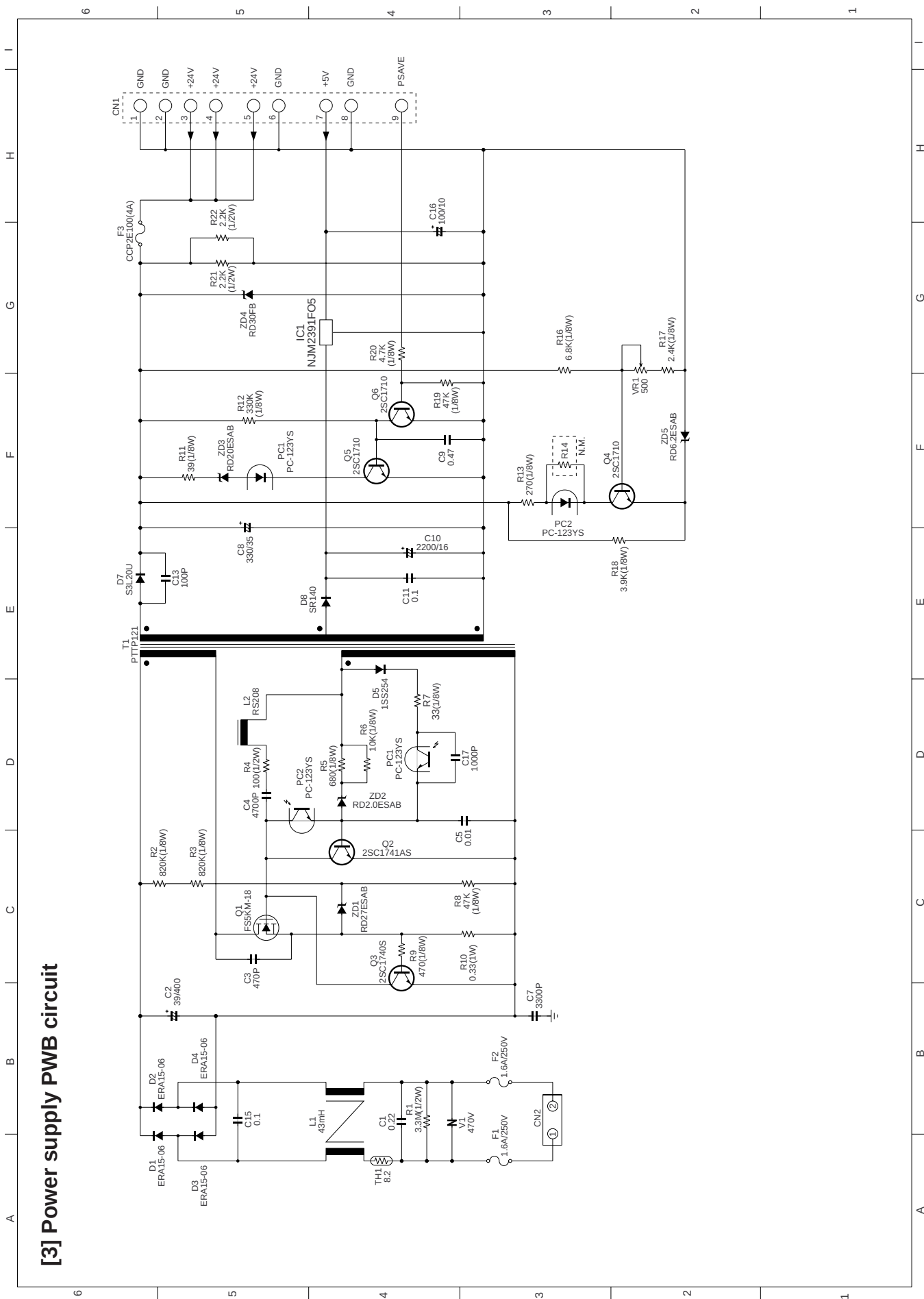
NOTE:
△ These marks are all safety-critical parts.



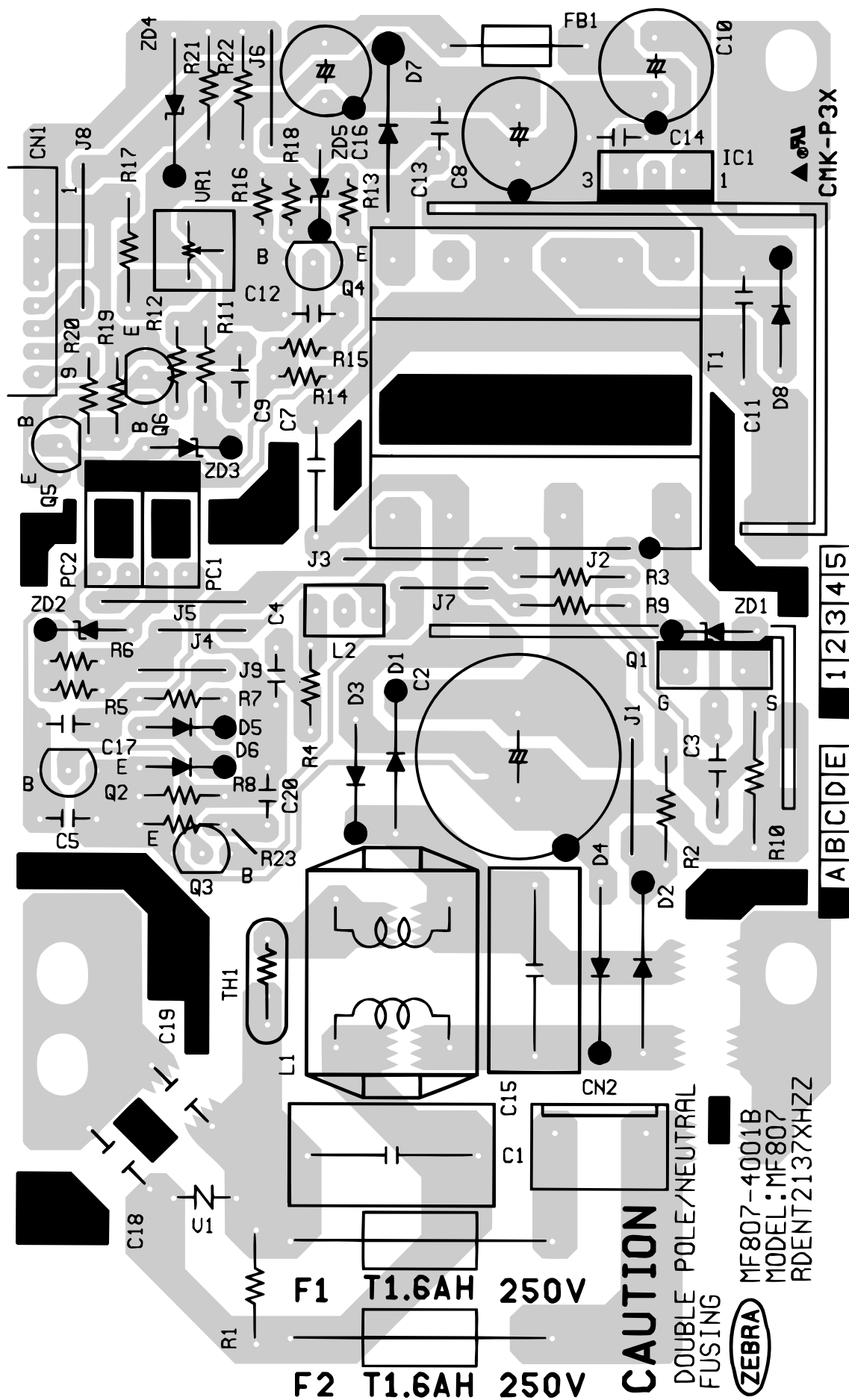


TEL/LIU PWB parts layout (Bottom side)

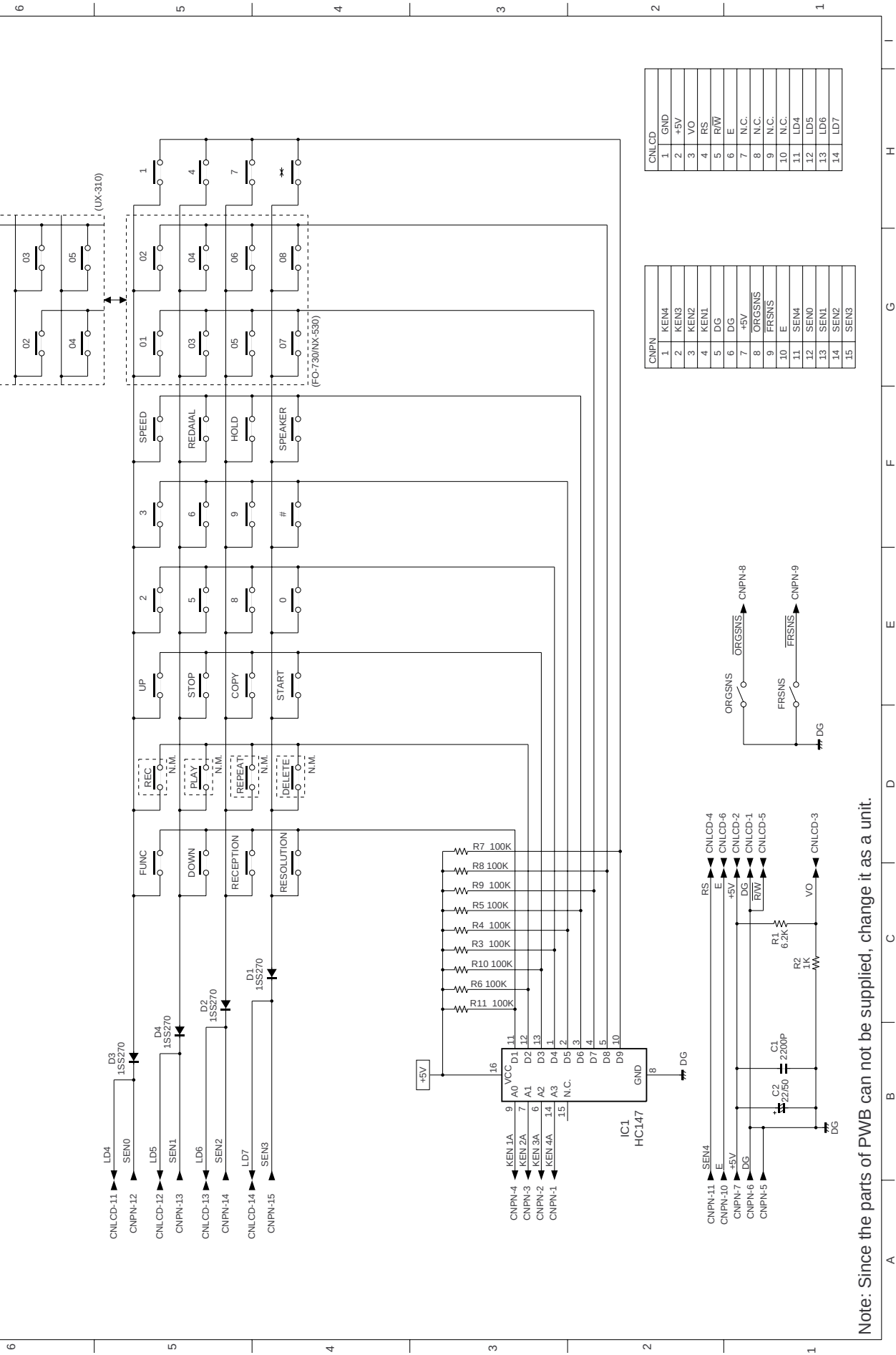




Power supply PWB parts layout

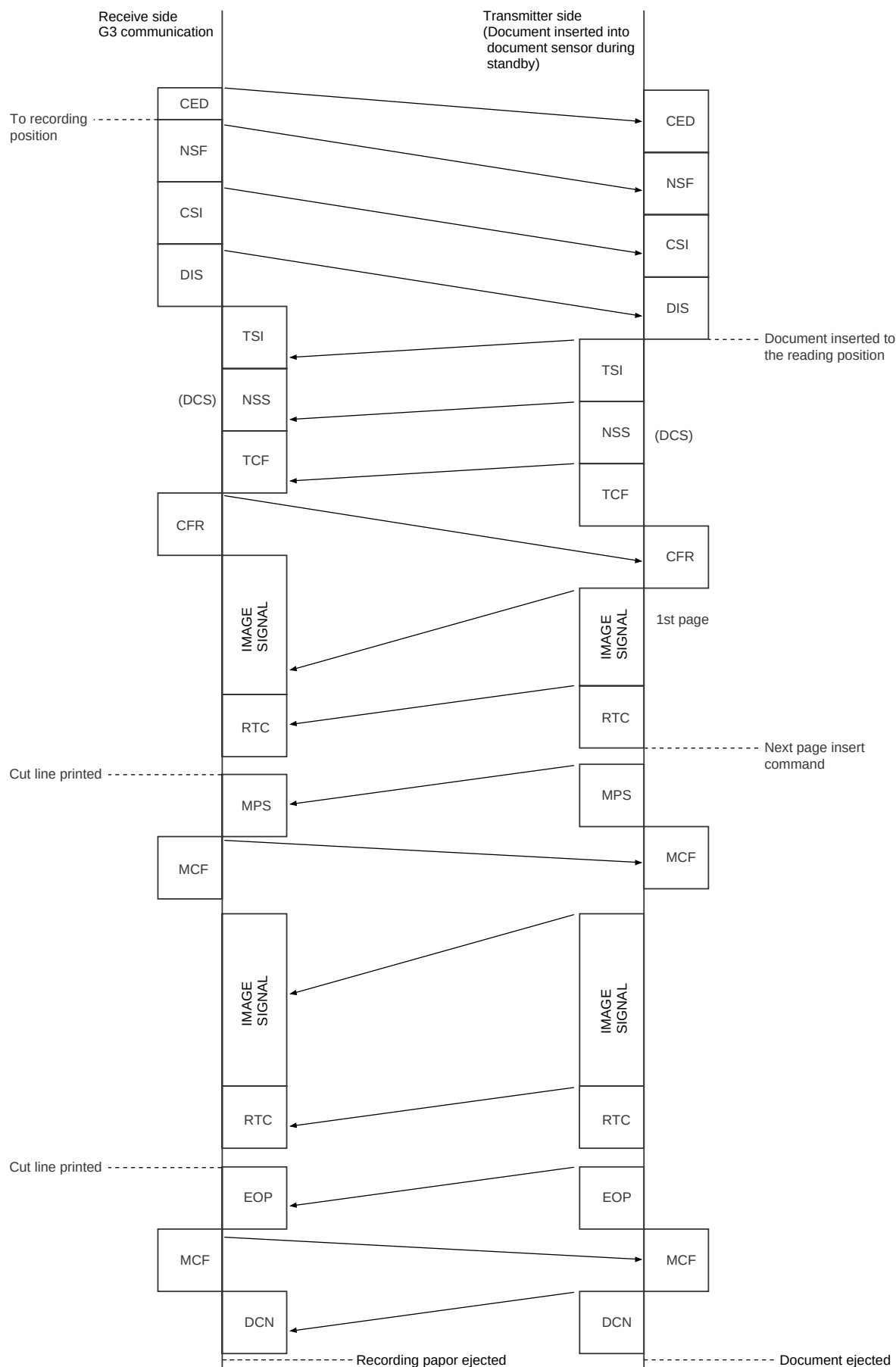


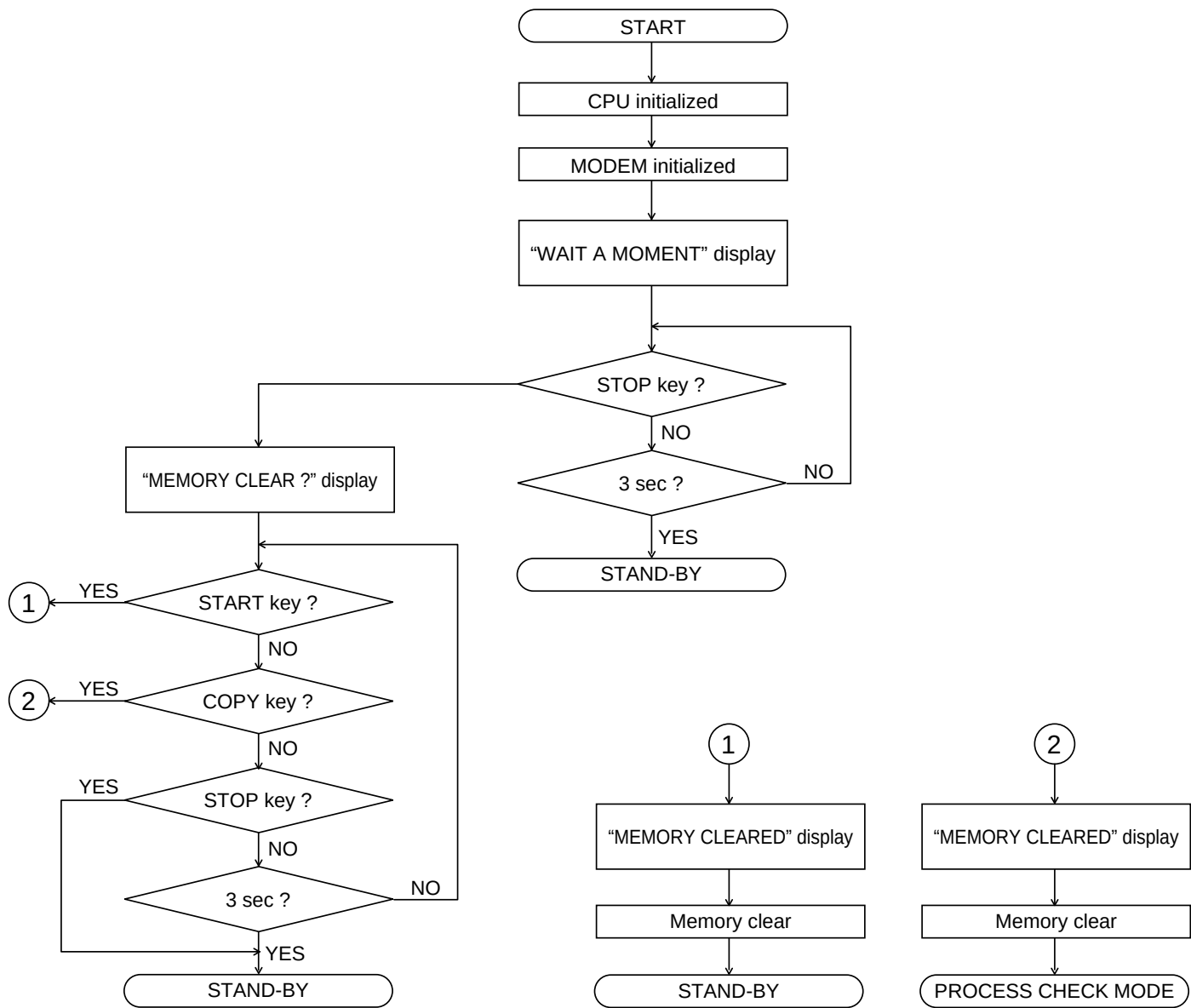
[4] Operation panel PWB circuit



CHAPTER 7. OPERATION FLOWCHART

[1] Protocol





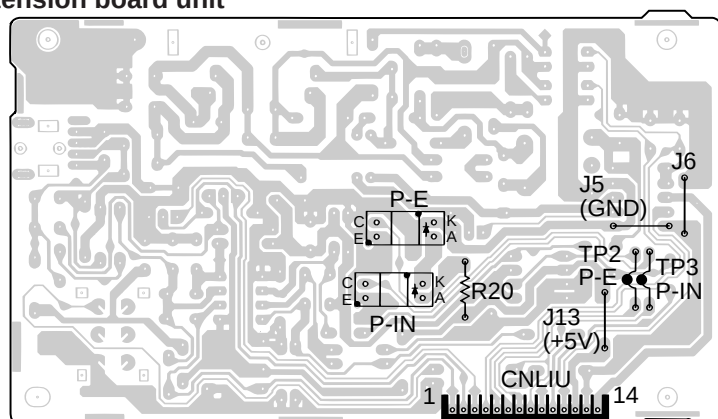
CHAPTER 8. OTHERS

[1] Service tools

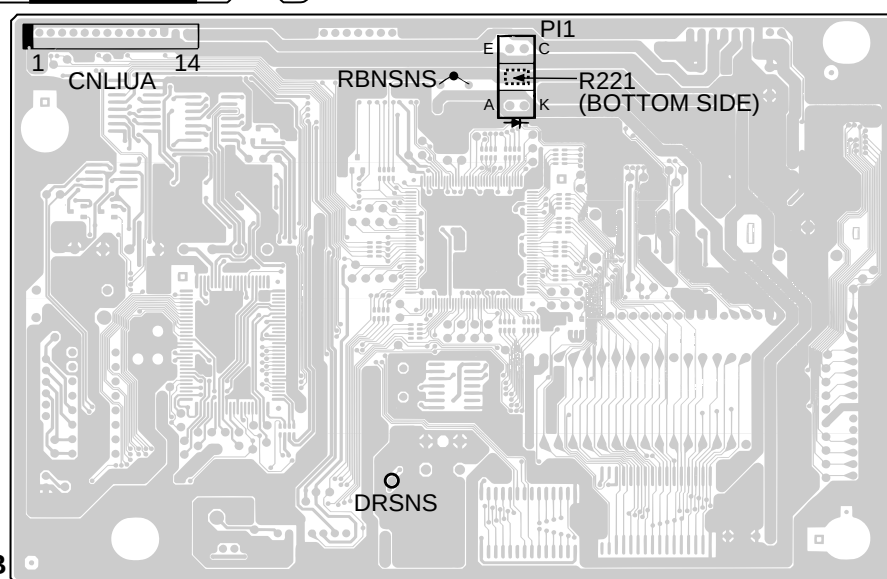
1. List

NO.	PARTS CODE	DESCRIPTION	Q'TY	PRICE RANK
1	C P W B S 3 0 0 2 S C S 1	Extension board unit (Control PWB)	1	BK
2	C P W B F 3 0 0 3 S C S 1	Extension board unit (TEL/LIU PWB)	1	BP
3	P S H E Z 3 3 5 4 S C Z Z	Shading wave memory standard paper	1	AD

Extension board unit



TEL/LIU PWB



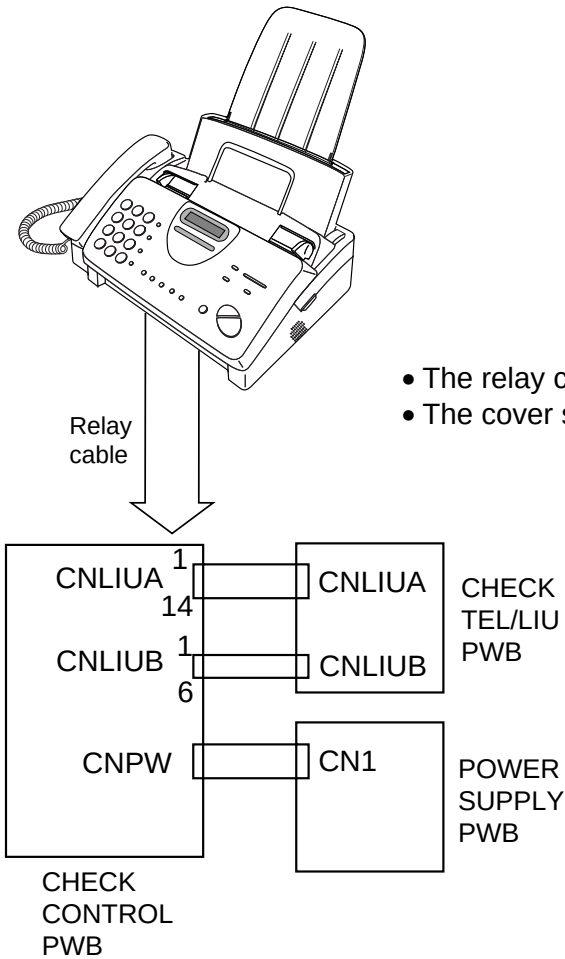
CONTROL PWB

NO.	PARTS CODE	DESCRIPTION	Q'TY	PRICE RANK
1	C C N W - 4 7 5 6 S C 0 1	SPEAKER RELAY CABLE	1	AK
2	C C N W - 4 7 5 7 S C 0 1	PANEL RELAY CABLE	1	AW
3	C C N W - 4 7 5 8 S C 0 1	CIS RELAY CABLE	1	AQ
4	C C N W - 4 7 5 9 S C 0 1	HEAD RELAY CABLE	1	AX
5	C C N W - 4 7 6 0 S C 0 1	CAM SWITCH RELAY CABLE	1	AK
6	C C N W - 4 7 6 3 S C 0 1	MOTOR RELAY CABLE	1	AP
7	Q C N W - 4 9 6 9 S C Z Z	PAPER SENSOR RELAY CABLE	1	BF
8	V R S - T S 2 A D 2 2 1 J	RESISTOR (1/10W 220Ω ±5%)[R221]	1	AA
9	V H P S G 2 0 6 S / - 1	PHOTO TRANSISTOR [PI1]	1	AG
10	Q S W - M 2 2 5 9 X H Z Z	COVER SWITCH [SW1]	1	AF
11	Q C N C M 2 5 7 5 S C 1 D	CONNECTOR (14PIN)[CNLIUA]	1	AC
12	V R D - H T 2 E Y 1 0 1 J	RESISTOR (1/4W 100Ω ±5%)[R20]	1	AA
13	V H P S G 2 0 6 S / - 1	PHOTO TRANSISTOR [P-IN]	1	AG
14	V H P S G 2 0 6 S / - 1	PHOTO TRANSISTOR [P-E]	1	AG
15	Q C N C W 2 5 0 9 S C 1 D	CONNECTOR (14PIN)[14PIN]	1	AF

2. Description

2-1. Relay board unit

1. Remove the TEL/LIU PWB, control PWB and Power Supply PWB from this unit, and mount the relay board unit instead.
 - Before connecting the wiring to the relay board unit, set the test PWB switches to the fixed position.
2. The setting is as follows.



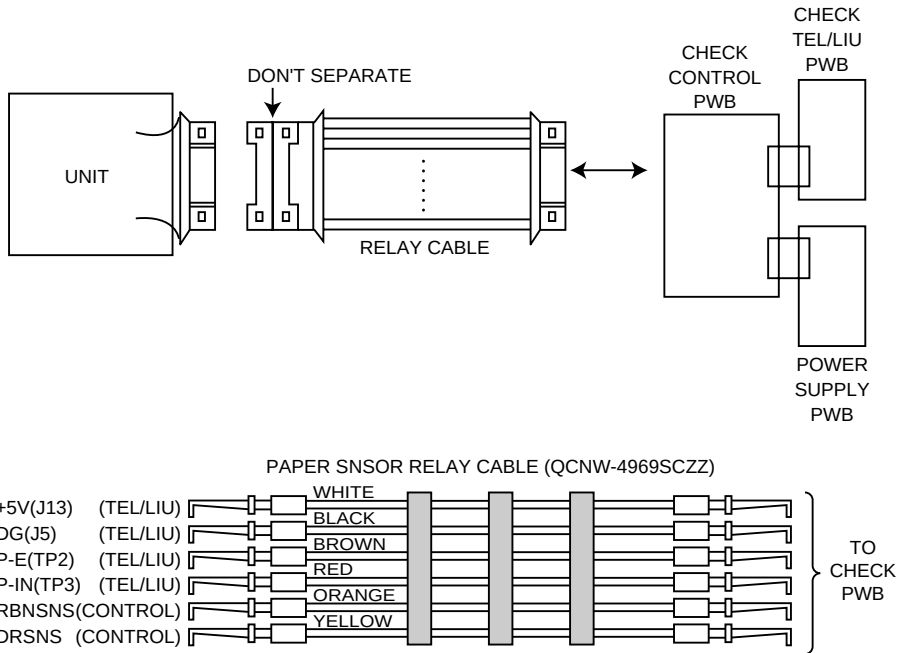
- The relay cables are used as one pair.
- The cover switch and hook switch are manually operated.

The recording paper sensor (P-E) and the hook switch are operated by OR of the mechanical unit switch and the test PWB switch. When performing installation in the machine unit, set the test PWB switches to the fixed position.

	Mechanical unit	PWB to be tested
	Actual operation with mechanical unit	
Recording paper sensor	ON/OFF operation	OFF (Photo interrupter is interrupted.)
Hook SW	ON/OFF operation	ON-HOOK
	PWB sensor check	
Recording paper sensor	OFF	ON/OFF operation
Hook SW	ON-HOOK	ON/OFF operation

* Recording paper: ON
No recording paper: OFF

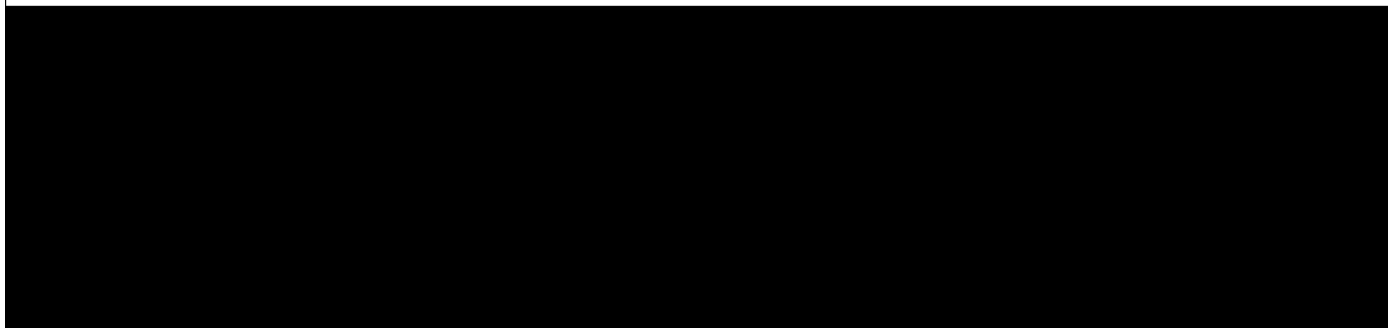
NOTE



3. Shading paper

The white and black basis is applied to remember the shading waveform. Be sure to perform this operation when replacing the battery or replacing the control PWB. Execute in the shading mode of DIAG mode.

UX-300 SERIES SHADING WAVE MEMORY STANDARD PAPER (PSHEZ3354SCZZ)

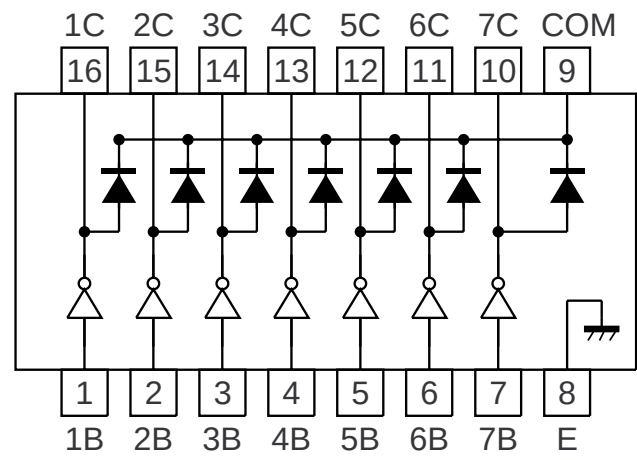


UX-310DE
FO-730DE/NX-530DE

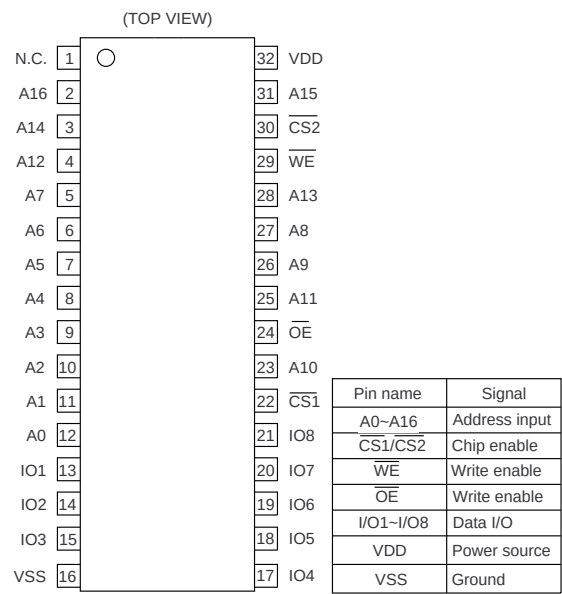
[2] IC signal name

CONTROL PWB UNIT

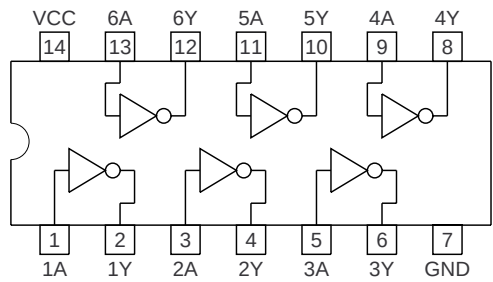
IC5: VHiULN2003AN/ (ULN2003ANS)



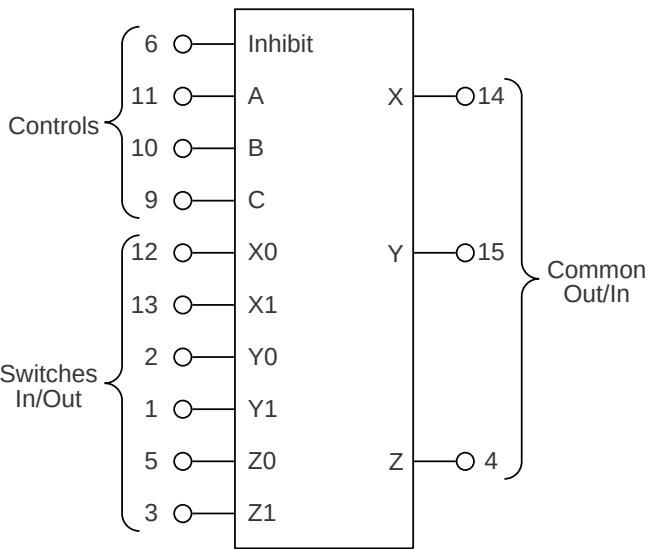
IC2: VHiW24010S7LE (W24010S-70LE)



IC7: VHiTC74HCU04F(TC74HCU04F)

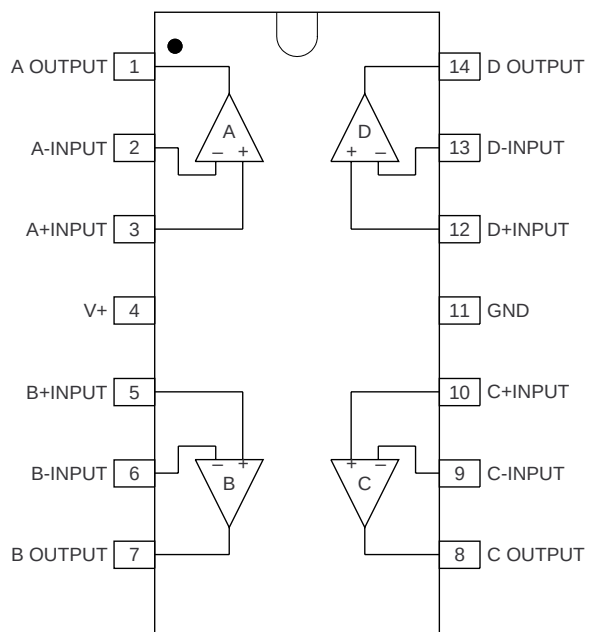


IC11: VHiHCF4053M1T (HCF4053B)

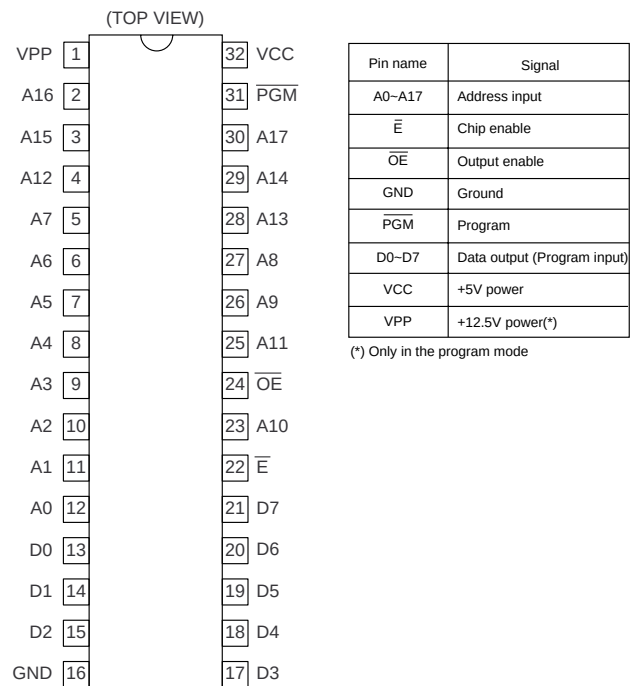


VDD: Pin 16
VSS: Pin 8
VEE: Pin 7

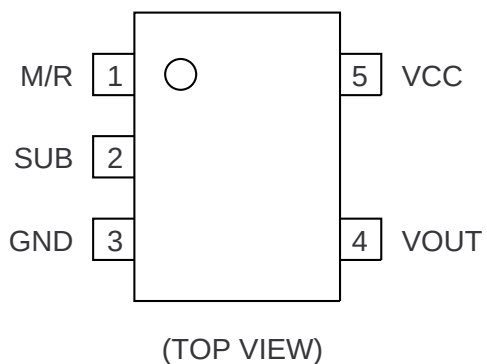
IC12: VHiNJM2902M-1 (NJM2902M)



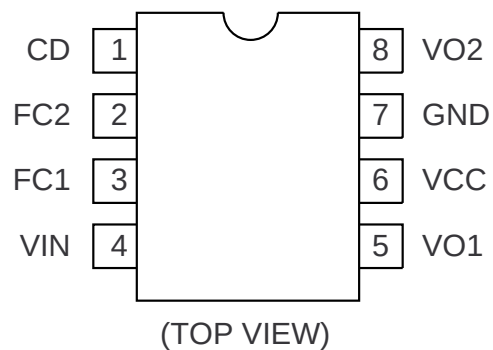
IC4: VHi27C20012MX (27C020)
EP-ROM



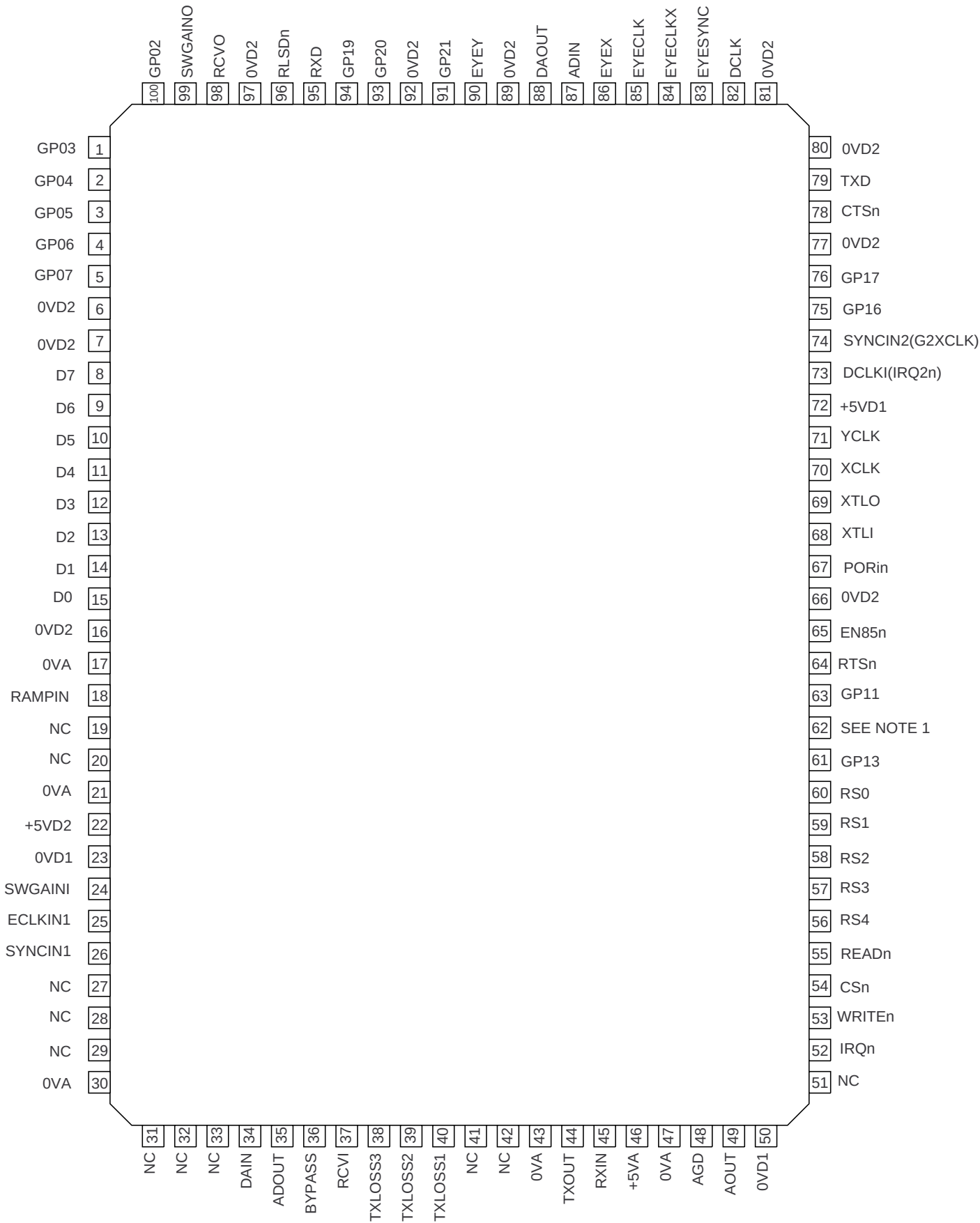
IC8: VHiPST596CMT1 (PST596CNR)



IC10: VHiMC34119DR2 (MC34119)



UX-310DE
FO-730DE/NX-530DE
IC6: VHiR96CiDFC1M (R96DFXL-CID)



IC9: VHiR96CiDFC1M (FC100M)

